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Announcement of the Thirty-Third

Summer Session

1924

July 5—August 15

Ithaca, New York
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March 1, 1924

ANNOUNCEMENT OF THE SUMMER SESSION

This pamphlet is designed to give prospective students complete information about the Summer Session of Cornell University. On the last page there is a list of other publications which describe the courses of study offered during the regular academic year by the several colleges and schools of the University.

SUMMER SESSION OF THE COLLEGE OF LAW

See page 46 for information about the summer courses in Law to be given at Cornell University in 1924.

THE SUMMER SCHOOL OF BIOLOGY

See page 48 for information about the summer courses in Biology to be given at Cornell University in 1924.

THE SUMMER SCHOOL OF AGRICULTURE

See page 53 for information about the summer courses in Agriculture to be given at Cornell University in 1924.

OFFICE AT GOLDWIN SMITH 121

The office of the Summer Session is in Room 121, Goldwin Smith Hall. This office will be open as a bureau of information on registration days from 9 A. M. till 1 P. M. and from 2 till 5 P. M., and thereafter, throughout the session, daily except Saturday from 9 till 12:30 and from 2 till 4.

Most members of the staff of instruction may be consulted at their offices on Saturday, July 5, and on Monday, July 7.

THE SESSION MUST BEGIN PROMPTLY

In order to get the full number of exercises announced for the session, it is necessary that all work begin promptly on Monday morning, July 7. Students are urged to reach Ithaca in time to be present at the first exercise of each class. If possible, the student should register on Saturday, July 5; if not, then on Monday, July 7, in an hour not occupied by class work.

THE CALENDAR

SUMMER SESSION OF 1924

THE FIRST TEN DAYS

July 5, Saturday, 8 A. M.—5 P. M.	Registration, <i>Room A, Goldwin Smith Hall.</i>
July 7, Monday.....	Instruction begins at the time and place announced for each course. Registration is continued in <i>Room A, Goldwin Smith Hall.</i>
July 8, Tuesday evening.....	Organ Recital, <i>Sage Chapel.</i>
July 9, Wednesday evening.....	Departmental Lectures and Conferences.
July 10, Thursday evening.....	Piano Recital, Professor Otto Kinkeldey.
July 11, Friday, until 4 P. M.....	Last day for payment of fees at the Treasurer's office, <i>1 Morrill Hall.</i>
July 13, Sunday, 11 A. M.....	Public Worship and Sermon in <i>Sage Chapel.</i>
July 13, Sunday evening.....	Organ Recital, <i>Bailey Hall.</i>
July 14, Monday evening.....	Lecture Course, <i>Barnes Hall.</i>

THE REGULAR WEEKLY SCHEDULE

Sunday, 11 A. M.	Public Worship and Sermon, <i>Sage Chapel.</i> (Beginning July 13.)
Sunday evening,	Organ Recital, <i>Bailey Hall.</i> (Beginning July 13.)
Monday evening,	Lecture Course, <i>Barnes Hall.</i> (Beginning July 14.)
Tuesday evening,	Organ Recital, <i>Sage Chapel.</i> (Beginning July 8.)
Wednesday evening,	Departmental Lectures and Conferences. (Beginning July 9.)
Thursday evening,	Piano Recital, Professor Kinkeldey. (Beginning July 10.)

CONCERTS

July 18, Friday evening:	Concert. <i>Bailey Hall.</i> Artist to be announced.
August 1, Friday evening:	Concert. <i>Bailey Hall.</i> Artist to be announced.

THE LAST DAY

August 15, Friday.....	Summer Session ends.
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THE WEEKLY CALENDAR

The WEEKLY CALENDAR of the University carries announcements of all public exercises held in connection with the Summer Session. It is posted on the bulletin boards.

THE SUMMER SESSION OF 1924

OFFICERS

The President of the University

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D.

The Registrar

DAVID FLETCHER HOY, M.S.

The Dean of Women

GEORGIA LAURA WHITE, Ph.D.

ADMINISTRATIVE BOARD

RALPH HAYWARD KENISTON, Ph.D., Dean of the Graduate School
DEXTER SIMPSON KIMBALL, M.E., Dean of the College of Engineering
ROBERT MORRIS OGDEN, Ph.D., Dean of the College of Arts and Sciences
GEORGE ALAN WORKS, Ph.B., M.S.A., Summer School of Agriculture

Executive Committee

RIVERDA HARDING JORDAN, Ph.D., *Chairman*
BENTON SULLIVAN MONROE, Ph.D., *Secretary*

STAFF OF INSTRUCTION

(The names of the instructors in the Summer School in Agriculture are printed on page 53; those of the instructors in the Summer Session of the College of Law, on page 46; those of the instructors in the Summer School of Biology, on page 48.)

ALFRED WILLIS ABRAMS, Ph.B. Education
(Chief, Visual Instruction Division, New York State Department of Education)
BRISTOW ADAMS, B.A. Drawing and Painting
(Professor in the Extension Service)
ALBERT LEROY ANDREWS, Ph.D. German
(Assistant Professor of German)
CARL BECKER, Ph.D. History
(Professor of Modern European History)
BEN RAYMOND BEISEL. Mathematics
(Instructor in Mathematics)
HOMER GUY BISHOP, Ph.D. Psychology
(Instructor in Psychology)
SAMUEL LATIMER BOOTHROYD, B.S. Astronomy
(Professor of Astronomy)
JULIAN PLEASANT BRETZ, Ph.D. History
(Professor of American History)
THOMAS ROLAND BRIGGS, Ph.D. Chemistry
(Assistant Professor of Physical Chemistry and Electro-Chemistry)
LILLIAN FRED BROTHERHOOD, A.M. Geology
(Teacher, National Park Seminary, Washington, D. C.)
LESLIE NATHAN BROUGHTON, Ph.D. English
(Assistant Professor of English)
ROBERT MARSHALL BROWN, A.M. Geology
(Professor of Geology, Rhode Island State College, and of Geology and Economic
Geography, Rhode Island College of Education)
ARTHUR WESLEY BROWNE, Ph.D. Chemistry
(Professor of Inorganic and Analytical Chemistry)

EARLE NELSON BURROWS, M.C.E.	Structural Engineering
(Assistant Professor of Structural Engineering)	
WALLACE E. CALDWELL, Ph.D.	History
(Associate Professor of History, University of North Carolina)	
HARRY CAPLAN, Ph.D.	Public Speaking
(Instructor in Public Speaking)	
WALTER BUCKINGHAM CARVER, Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
ROGER CHAMPOMIER	French
(Instructor in Romance Languages)	
GEORGE HERBERT CLARKE, M.A., Litt. D.	English
(Professor of English, University of the South; Editor of the Sewanee Review)	
JACOB ROLAND COLLINS, Ph.D.	Physics
(Assistant Professor of Physics)	
ROBERT BRAINARD COREY, B.Chem.	Chemistry
(Instructor in Chemistry)	
WALTER RODNEY CORNELL, B.S.	Mechanics
(Assistant Professor of the Mechanics of Engineering)	
RALPH THOMAS KLINE CORNWELL, B.Chem.	Chemistry
(Instructor in Chemistry)	
LOUISE COURTOIS	French
(Instructor in French, University of Oklahoma)	
CLYDE FIRMAN CRAIG, Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
GEORGE IRVING DALE, Ph.D.	Spanish
(Associate Professor of Spanish and Italian, Washington University)	
KARL M. DALLENBACH, Ph.D.	Psychology
(Assistant Professor of Psychology)	
ARTHUR HENRY DOYLE, M.A.	Spanish
(Instructor in the Romance Languages and Literatures)	
CHARLES LOVE DURHAM, Ph.D., Litt.D.	Latin
(Professor of Latin)	
JEANNETTE EVANS, M.D.	Hygiene
(Medical Adviser of Women)	
ALBERT BERNHARDT FAUST, Ph.D.	German
(Professor of German)	
FREDERICK EBELL FISKE, Ph.D.	English
(Assistant Professor of English)	
JEAN M. GELAS	Physical Education
(Instructor in Physical Education, Hamilton College)	
ARTHUR WARD GILBERT, B.S.	Education
(Instructor in Education)	
DAVID CLINTON GILLESPIE, Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
MASON D. GRAY, Ph.D.	Latin
(Head, Department of Latin, East High School, Rochester, N. Y.)	
GUY SHEPARD GREENE, A.B.	English
(Instructor in English)	
OTHON GOEPP GUERLAC, Licencié es lettres, Licencié en droit, M.A., LL.B.	French
(World War Memorial Professor of the Romance Languages and Literatures)	
WILLIAM ALEXANDER HAMMOND, Ph.D.	Philosophy
(Sage Professor of Ancient Philosophy and of Aesthetics)	
FRANK H. HANKINS, Ph.D.	Economics
(Professor of Economics and Sociology, Smith College)	

THE SUMMER SESSION

JOSE MARIA HERNANDEZ, A.M.	Spanish
(Instructor in Spanish, University of Oklahoma)	
MARVIN THEODORE HERRICK	Public Speaking
(Assistant in Public Speaking)	
EMILY HICKMAN, Ph.D.	History
(Professor of History, Wells College)	
LOUIS BENJAMIN HOISINGTON, Ph.D.	Psychology
(Assistant Professor of Psychology)	
HARLEY EARL HOWE, Ph.D.	Physics
(Assistant Professor of Physics)	
HOULDER HUDGINS	Economics
(Instructor in Economics and Accounting)	
LEE SISSON HULTZEN	Public Speaking
(Assistant in Public Speaking)	
EVERETT LEE HUNT, A.B.	Public Speaking
(Assistant Professor of Public Speaking)	
WALLIE ABRAHAM HURWITZ, Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
JOHN IRWIN HUTCHINSON, Ph.D.	Mathematics
(Professor of Mathematics)	
RIVERDA HARDING JORDAN, Ph.D.	Education
(Professor of Education)	
MYRON SLADE KENDRICK, A.M.	Economics
(Instructor in Economics)	
OTTO KINKELDEY, Ph.D.	Music
(Professor of Music)	
HAROLD TALBOT LACEY, B.Chem.	Chemistry
(Assistant in Chemistry)	
HENRY LEIGHTON, A.B.	Geology
(Professor of Geology, University of Pittsburgh)	
WILLIAM H. LIVERS, M.A.	Education
(Director of Extension, North Carolina College for Women)	
GORDON RANDOLPH McCORMICK, B.Chem.	Chemistry
(Assistant in Chemistry)	
ASA EMANUEL McKINNEY, Ph.D.	Chemistry
(Instructor in Chemistry)	
JAMES FREDERICK MASON, Ph.D.	French
(Professor of Romance Languages and Literatures)	
MAY MARGARET MATTSON, B.S.	Geology
(Teacher, High School, Trumansburg, N. Y.)	
PIERRE MERTZ, A.B.	Physics
(Instructor in Physics)	
VICTOR ELVERT MONNETT, Ph.D.	Geology
(Associate Professor of Geology, University of Oklahoma)	
BENTON SULLIVAN MONROE, Ph.D.	English
(Assistant Professor of English)	
CLYDE B. MOORE, Ph.D.	Education
(Professor of Education, University of Pittsburgh)	
DAVID WILSON MOORE	Chemistry
(Assistant in Chemistry)	
DAVID SHERMAN MORSE	Mathematics
(Instructor in Mathematics)	
GUY BROOKS MUCHMORE, A.B.	Public Speaking
(Assistant Professor of Public Speaking)	

STAFF OF INSTRUCTION

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CARLETON CHASE MURDOCK, Ph.D.	Physics
(Assistant Professor of Physics)	
MELVIN L. NICHOLS, B.Chem., Ph.D.	Chemistry
(Assistant Professor of Chemistry)	
PAUL ALLEN NORTHROP, B.S.	Physics
(Instructor in Physics)	
CLARK SUTHERLAND NORTHUP, Ph.D.	English
(Professor of English and Librarian of the Hart Memorial Library)	
WILLIAM RIDGELY ORNDORFF, Ph.D.	Chemistry
(Professor of Organic and Physiological Chemistry)	
FREDERICK WILLIAM OWENS, Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
ANDRÉ PROSPER PELMONT.	French
(Instructor in French, Rice Institute)	
HAROLD CHARLES PERKINS, M.E.	Mechanics
(Instructor in Mechanics)	
ARTHUR F. POLLARD, M.A., F.B.A., Litt.D.	History
(Professor of English History and Chairman of the Institute of Historical Research, University of London)	
MILES ALBION POND, Ph.D.	Descriptive Geometry
(Assistant Professor of Civil Engineering)	
CARLTON ELDERKIN POWER, Ph.D.	Physics
(Assistant Professor of Physics, New York State College for Teachers)	
LAURENCE PUMPELLY, Ph.D.	French
(Professor of Romance Languages and Literatures)	
HAROLD LYLE REED, Ph.D.	Economics
(Professor of Economics and Finance)	
ERNEST WILLIAM RETTGER, Ph.D.	Mechanics
(Professor of Mechanics of Engineering)	
FLOYD KARKER RICHTMYER, Ph.D.	Physics
(Professor of Physics)	
FRED STILLMAN ROGERS, M.E.	Kinematics
(Assistant Professor of Machine Design)	
GEORGE H. SABINE, Ph.D.	Philosophy
(Professor of Philosophy, Ohio State University)	
RASMUS SABY, Ph.D.	Government
(Assistant Professor of Political Science)	
ERNEST WILLIAM SCHODER, Ph.D.	Hydraulics
(World War Memorial Professor of Experimental Hydraulics)	
FRANCIS ROBERT SHARPE, Ph.D.	Mathematics
(Professor of Mathematics)	
LUIS N. SHERWELL.	Spanish
(Teacher of Spanish, Stuyvesant High School, New York City)	
DEAN FRANKLIN SMILEY, M.D.	Hygiene
(Assistant Professor of Hygiene and Medical Adviser)	
C. WILSON SMITH, M.A.	Education
(Assistant Professor of Education)	
VIRGIL SNYDER, Ph.D.	Mathematics
(Professor of Mathematics)	
WALTER HUTCHINSON STANTON, A.B.	Physics
(Instructor in Physics)	
GEORGE WARE STEPHENS, Ph.D.	Economics
(Professor of Economics, Washington University)	

WALTER KING STONE.....	Drawing and Painting (Acting Assistant Professor of Drawing)
WILLIAM STRUNK, jr., Ph.D.....	English (Professor of English)
CHARLES KENNETH THOMAS, A.B.....	Public Speaking (Instructor in Public Speaking)
EDWARD BRADFORD TITCHENER, Ph.D., Litt.D., D.Sc., LL.D.....	Psychology (Sage Professor in the Graduate School, Lecturer in Psychology)
CLARENCE ELLSWORTH TOWNSEND, M.E.....	Mechanical Drawing (Assistant Professor of Drawing in the College of Engineering)
HARVEY GATES TOWNSEND, Ph.D.....	Education (Professor of Education, Smith College)
FORREST GLENN TUCKER, Ph.D.....	Physics (Assistant Professor of Physics)
LEONARD CHURCH URQUHART, C.E.....	Structural Engineering (Assistant Professor of Structural Engineering)
OSCAR DIEDRICH VON ENGELN, Ph.D.....	Geography and Geology (Professor of Physical Geography)
PAUL J. WEAVER.....	Music (Director of Music, University of North Carolina)
ALBERT EDWARD WELLS.....	Shop-Work (Sibley Professor of Mechanic Arts)
WILLIAM LLOYD GARRISON WILLIAMS, Ph.D.....	Mathematics (Assistant Professor of Mathematics)
LAVERNE HAROLD WILLISFORD, B.S.....	Chemistry (Assistant in Chemistry)
KARL DAWSON WOOD.....	Mechanics (Instructor in Mechanics of Engineering)

OBJECT OF THE SESSION

INSTRUCTION ADAPTED TO VARIOUS NEEDS

The primary object of the Summer Session is to advance education by helping those engaged in it. The instruction is adapted to the needs of the following classes:

1. Professors and teachers in colleges and schools, superintendents, and supervisors of special branches of instruction.

The announcements of the different departments show a wide range of work. This work is either advanced and, therefore, suited to specialists who wish to pursue their individual study; or more elementary and adapted to teachers who desire to start in a new field. In addition to the instruction of the classroom, the University's libraries, museums, laboratories, and shops are open for use.

2. College students in Cornell or other universities who wish to make some scholastic use of the long vacation, especially those whose college studies may for one reason or another have been interrupted. Graduates may count some of the courses toward an advanced degree. See the *Announcement of the Graduate School* with regard to opportunities for advanced work and research during the summer.

Undergraduates may anticipate requirements and thereby shorten their course, or may make up existing deficiencies. The conditions for receiving credit, and the amount which may be obtained, are stated below, under the head of Academic Credit For Work.

3. Students entering the University and wishing to obtain surplus credit at entrance, or to complete the entrance requirements.

It often happens that students have in June more or less than the requirements for admission to college. The Summer Session affords them the opportunity either to add to their surplus and thus, in some cases, to gain a year in time; or to make up their deficiency.

4. All persons qualified to pursue with profit any course given, whether or not they are engaged in formal study or teaching.

ACADEMIC CREDIT FOR WORK

IN THE COLLEGE OF ARTS AND SCIENCES

The academic requirements for the degree of Bachelor of Arts are the completion of one hundred and twenty hours of elective work. Before graduation a student must complete six hours in each of seven specified groups of study, thirty of these hours during the first two years, under certain restrictions (the underclass requirements). During his last two years he must also elect twenty hours in some one department or group of related departments (the upperclass requirements).

To obtain credit toward the Cornell degree by means of work done in Summer Sessions, a student must have previously satisfied the entrance requirements of the College, and must obtain in advance the Dean's approval of his selection of courses. He may then obtain

in any Summer Session credit for the number of hours he passes. To obtain credit for a term of residence he must pass a total of at least twelve hours in two or more Summer Sessions, with a minimum of four or a maximum of eight in each Session. Credit for two terms of residence, but no more, may be secured in this way.

IN OTHER COLLEGES OF THE UNIVERSITY

The nature and amount of credit allowed in other colleges at Cornell for work in the Summer Session may be learned from the statements under the announcement of each course.

IN THE GRADUATE SCHOOL

Graduate work at Cornell is not expressed in terms of courses or of hours. A graduate of any college whose requirements for a first degree are substantially equivalent to those for the first degree at Cornell may be admitted to resident study in the Graduate School. He may at once enter upon candidacy for an advanced degree if he is able to show that he has had adequate preliminary training in the subjects in which he proposes to work. The requirements for the degree do not depend primarily on the completion of any prescribed number of courses or of a fixed term of residence. They are rather based upon actual achievement in scholarship and research in the fields indicated by the major and minor subjects. The writing of a thesis and the passing of a special examination are also required. The minimum period of residence for the Master's degree is one academic year or its equivalent, and for the Doctor's degree three years.

Not all work done by a graduate student is graduate work in the strict sense of the term. Graduate work to be considered acceptable for a degree must be of advanced character in some field or department of knowledge. No residence towards a master's degree will be granted any student who does not register with the Dean of the Graduate School within three days after the opening of the Session, and who does not formally become a candidate for this degree under the direction of a special committee. The latest day for such registration in 1924 is July 10.

Students of the University Summer Session, of the Summer School of Biology, and of the Summer School in Agriculture who have been admitted to candidacy for an advanced degree are required to pay the regular tuition of the session but are exempt from tuition and administration fees in the Graduate School. On registering for the first time as candidates, students who have not previously matriculated in Cornell University will be given matriculation without payment of the usual fee on presenting a certificate that they have paid the tuition charges for the current Summer Session.

Students registered in the Graduate School and excused from tuition in the Summer School in Agriculture as residents of New York State are charged on their first registration in the Graduate School a matriculation fee of \$10, and for each session an administration fee of \$6.25.

The residence requirements for the degree of Master of Arts may be fulfilled in whole or in part by attendance during the Summer Session of the University. For this purpose, two Summer Sessions will be regarded as the equivalent of one term, and four Summer Sessions as the equivalent of one year. Candidates for this degree who are in residence during Summer Sessions only are also required to continue their studies during the year under the direction of the chairman of the special committee in charge of their work.

Any person wishing to become a candidate for an advanced degree and to study during the Summer Session is advised to write to the professor whose work he expects to take, and also to the Dean of the Graduate School, asking for a blank form of application for admission to the Graduate School. It is much better to make these arrangements before coming to Ithaca, thus avoiding delay and interruption of study after the Summer Session has begun. In this way, moreover, it may be possible to secure the advice and guidance of professors in fields of study of which no specific mention is made in the announcements. Not all departments formally offer graduate work. In some departments, notably in the Summer School of Biology, opportunities for research may be had for a longer period than the six weeks during which courses are formally conducted.

In certain departments also an invitation is issued to scholars who are beyond the stage of regular graduate study to make use of the resources of the University in these fields for carrying on research.

CERTIFICATES FOR WORK DONE

Students of the Summer Session who are not matriculated in the University may receive certificates of attendance and of work satisfactorily performed. Application for them must be made before August 15, and the applicant must leave at the office of the Registrar a large-sized envelope stamped and directed to his home address. The certificate will then be forwarded by mail. The regulations of each department for the granting of a certificate must be met.

GENERAL INFORMATION

ADMISSION

There are no examinations for admission to the Summer Session. Each person must, however, satisfy the instructor in charge of every course he intends to take, unless it be elementary, that he is qualified to pursue the work.

There are some special requirements to be met by applicants for admission to the summer session of the College of Law, and such persons should consult the announcement of that session, on page 46 of this pamphlet.

Admission to the classrooms during the Summer Session is restricted to students duly registered for the session. A student duly registered may visit any class.

If a student entering the Summer Session wishes his work to count toward a degree, there are certain regulations that he must comply with, and he will find them set forth under the head of Academic Credit for Work, page 9.

REGISTRATION

All students of the Summer Session are required to register with the Registrar of the University. The hours and places of registration are given in the Calendar of the session, on page 3. Students may register on Saturday, July 5, between 8 a. m. and 5 p. m., or on the day of their arrival, if they reach Ithaca on July 7 or later. They are urged to register on July 5. Registration before that day is not required, and it is not necessary to apply in advance for registration blanks.

Beginning on Tuesday, July 8, the Registrar's office in Morrill Hall will be open from 9 a. m. till 4 p. m. every week day except Saturday, when it will be closed at noon.

Students who wish to obtain credit for graduate work to be done during the Summer Session must register not only with the Registrar but also with the Dean of the Graduate School, at his office in Room 22, Morrill Hall.

Persons who are to take courses in the Summer School of Agriculture and in any department of the Summer Session of the University must register for both the Summer School and the Summer Session. They are required to pay only one tuition fee.

TUITION

The charge for tuition in the Summer Session of the University is forty dollars. In the summer session of the College of Law it is sixty-five dollars for the whole session of eleven weeks, or thirty-five dollars for either term of five and one-half weeks.

The tuition fee is payable in full, on the first registration day or within the next five days, at the office of the Treasurer, Room 1, Morrill Hall.

Any student who fails to pay his tuition charges, other fees, and other indebtedness to the University, or who, if entitled to free tuition, fails to claim it at the Treasurer's office and to pay his fees and other indebtedness, within the prescribed period of grace, is thereby dropped from the University unless the Treasurer has granted him an extension of time to complete payment. The Treasurer is permitted to grant such an extension when, in his judgment, the circumstances of a particular case warrant his doing so. For any such extension the student is assessed a fee of \$5 for the first week and \$2 additional for each subsequent week in which the whole or any part of the debt remains unpaid, but the assessment in any case is not more than \$15. The assessment may be waived in any instance for reasons satisfactory to the Comptroller and the Registrar, when such reasons are set forth in a written statement.

If a student withdraws from the Summer Session, the Treasurer may refund a part of the tuition fee or cancel a part of the obligation that the student has incurred for tuition, provided the reason for the withdrawal be stated in writing and be satisfactory to the Comptroller and the Registrar. In such a case the student is required to pay twenty-five per cent of the term's tuition for each week or fraction of a week between the first registration day and the date of his certificate of withdrawal.

Students registering at any time during the last four weeks of the Summer Session or of either term of the summer session of the College of Law are required to pay for the remainder of the term at the rate of twenty-five per cent of the term's tuition for each week or fraction of a week between the date of registration and the last examination day of the term.

Any tuition fee or other fee may be changed by the Trustees to take effect at any time without previous notice.

IN THE SUMMER SCHOOL OF AGRICULTURE

Tuition in any of the courses of the Summer School of Agriculture is free to admitted students who are residents of the State of New York and who have been residents for at least one year immediately preceding registration. *An incidental fee of ten dollars* is, however, charged to all students for admission. Students from outside the State of New York, whether they take one subject or more, are required to pay forty dollars, in which is included the incidental fee.

Free tuition does not include instruction in the Summer School of Biology or any instruction outside the College of Agriculture, nor are students receiving free tuition permitted to attend classes outside the College of Agriculture.

OTHER FEES

In *Chemistry* a laboratory fee is charged for material actually consumed. A deposit of such amount as the instructor may prescribe must be made with the Treasurer.

In *Physics* a laboratory fee is charged at the rate of two dollars for each laboratory period each week. The entire amount must be paid to the Treasurer at the beginning of the session.

In *Geography and Geology*, in Course S 8 and in Course S 9 a fee of one dollar must be paid in advance to the Treasurer to cover incidental expenses of the course.

Biology. A laboratory fee is charged for each course in Biology, varying with the character of the course. The amount which the

student must expect to pay upon beginning any course is stated in the description of that course, under the head of Summer School of Biology, page 48.

Swimming. A special charge of ten dollars is made for the instruction in Swimming

Equitation. A special charge of twenty dollars is made for the instruction in Equitation.

Shop-Work. Students not matriculated in the College of Engineering of Cornell University are required to pay a fee of \$3.50 for each credit hour of shop-work for which they register.

Library. A person who obtains the privilege of taking books from the University Library for home use is required to make a deposit of five dollars, which will be refunded upon the return of all books taken out.

RESIDENTIAL HALLS: ROOMS: BOARD

FOR WOMEN

The University has three residential halls for women in which rooms and board may be obtained during the Summer Session by registered students only. They are:

Sage College, which accommodates 175 persons. Here the charge for room, table board, and a specified amount of laundry, for the session, is from \$72 to \$87, according to the size and location of the room.

Prudence Risley Hall, which accommodates 184 persons. Here the charge for room, table board, and a specified amount of laundry, for the session, is from \$78 to \$87, according to the size and location of the room.

Cascadilla Hall. In this building, which accommodates about 160 persons, a furnished room may be had for the session at a cost of \$23 to \$29. The charge includes a specified amount of laundry. This building has shower baths and not tubs. On the ground floor the University conducts a cafeteria restaurant where meals can be obtained at reasonable rates.

Besides these halls, there are certain *approved houses* which are occupied exclusively by women and which, like the halls, are under the direct supervision of the Dean of Women.

Undergraduate women students of Cornell and other colleges and other women students under twenty-one years of age are expected to live in the residential halls or the approved houses. It is not advisable for any woman student to engage a room in a place not recommended by the University.

In Sage College and Prudence Risley Hall, the charge for room and board includes lodging Friday night, July 4 (not earlier), breakfast Saturday, July 5, and all meals to and including breakfast Saturday, August 16.

Members of the Summer Session who lodge outside Sage College and Prudence Risley Hall may obtain table board at either of those halls for \$9 a week.

Each of the residential halls is in charge of a warden, who is glad to know the students, to advise them in illness or other emergency, and to give them whatever information they wish about the University or the town. It is understood that persons living in the halls will conform to the house regulations made for the convenience and comfort of all.

Application for rooms in any of the residential halls or approved houses for women should be made to the Manager of Residential Halls, Sage College, Ithaca, N. Y. Information about such rooms may be obtained from the Manager in advance of the application. The list of approved houses will be available after June 1st on application to the Manager, and also, if desired, a supplementary list of private houses with desirable rooms available for mature women who prefer to live outside any of the halls or approved houses. Checks should be drawn to the order of Cornell University.

A deposit of five dollars must accompany each application for a room in any of the three residential halls; otherwise the application will not be entertained. The rooms are reserved in the order of application. If a room assigned is occupied by the applicant, the amount of the deposit is held until the end of the session to cover the return of keys and any damage to building or furniture other than ordinary wear and tear, and to insure the completion of the lease. The deposit will be refunded if the applicant gives formal notice to the Manager on or before June 15 that she wishes to withdraw her application.

FOR MEN

Men attending the Summer Session can obtain comfortable and attractive rooms in the new Residential Halls for Men, which are west of the main quadrangle, conveniently near to the other University buildings. These halls are thoroughly modern and of fireproof construction.

Application for rooms in the Residential Halls for Men, or for plans of the rooms or other information about them, should be made to the University Comptroller, Morrill Hall, Ithaca, N. Y. Checks should be drawn to the order of Cornell University.

The charge for furnished room, including care of the room and laundry of bed linen, is \$21 for the session. There are a few suites at a higher rate, and some rooms on the top floor may be had for less.

Board may be obtained for an average of \$1 to \$1.50 a day in a dining room within a hundred yards of the residential halls, which is conducted by the University on the cafeteria plan, or in other dining rooms or restaurants on or near the campus.

A list of private houses offering desirable rooms for rent for the session can be obtained after June 1st by application to the Manager of Residential Halls, Sage College, Ithaca, N. Y.

THE COST OF LIVING

An estimate of the cost of living in Ithaca in the summer can be made by consulting the figures given above. In a private house a student may be able to rent a room at a little less cost for the session than in one of the residential halls. Rooms are rented with the understanding that they will be occupied for the entire session unless both parties agree otherwise. Table board is generally engaged by the week.

MEANS OF SELF-SUPPORT

Students, either men or women, who wish to earn a part of their expenses during the session are invited to correspond in advance with the Manager of Residential Halls, Sage College, Ithaca.

THE STUDENT'S HEALTH

MEDICAL ADVICE

The University's staff includes a medical adviser of men and a medical adviser of women, and each of them has a corps of assistants. The medical advisers observe regular office hours, from 10 A. M. till 12 M. daily, at their respective offices in the Gymnasium for men and in Sage College for women. No charge is made for their services.

In cases of illness or indisposition which involve absence from classes even for one day, students are expected to report immediately either in person, by telephone, or by messenger to the medical adviser's office. For the convenience of the adviser such illness should be reported early in the day. Students indisposed but still able to attend classes should consult the medical adviser immediately in order that advice may be given and that diagnosis of incipient diseases may be made promptly. Any student failing to report as soon as possible to the medical adviser any contagious or infectious disease will be regarded as guilty of a serious breach of discipline.

A medical examination is not required of students in the Summer Session, but any student may have such an examination without charge by applying to the medical examiner.

A student may at any time be requested to withdraw from the University if, in the opinion of the University authorities, the condition of his health is such as to make it unwise for him to remain.

THE UNIVERSITY INFIRMARY

The University Infirmary occupies three large buildings near the campus. The first of these, a brownstone structure, was the home of Henry Williams Sage, for many years chairman of the Board of Trustees of the University. After his death in 1897, his sons, Dean and William Henry Sage, endowed it and gave it to the University for a students' infirmary as a memorial of their father. The second building, the Schuyler House, was purchased in 1911; in 1912 the Trustees erected a third building, fireproof, and this is the present main hospital building. The normal capacity of the Infirmary is seventy-five beds; the number can be doubled in an emergency.

The Infirmary, which is in charge of an experienced superintendent and is thoroughly equipped, provides suitable rooms, food, and nursing for sick students. It has no medical staff; students find their own physicians among practitioners in Ithaca or elsewhere.

Students in the Summer Session have all the privileges of admission to the Infirmary. They pay no fee in advance, but are liable to regular charges for services rendered.

THE LIBRARIES

The University Library is open on week days from 8 A. M. till 10:30 P. M. In this building are the main library, containing about 500,000 volumes, and most of the seminary and special libraries. The main reading room affords accommodations for more than two hundred readers, and contains a selected library of about 8,000 volumes of reference works. Below stairs is the periodical room in which are kept the current numbers of about 500 journals in various fields of knowledge. These rooms are open to all students. Students properly qualified are allowed the use of the seminary rooms and the books in them. The main collection is primarily a library of reference for use in the building. Students are, however, to a limited extent, allowed to take out books for home use. Persons wishing this privilege must make a deposit of \$5, which will be refunded upon the return of all books taken out.

The library of the College of Law numbers more than 56,000 volumes and about 5,800 pamphlets, to which generous additions are made yearly. It includes the library of the late Nathaniel C. Moak of Albany, N. Y., which was presented in 1893 by Mrs. A. M. Boardman and Mrs. Ellen D. Williams, as a memorial to Judge Douglas Boardman, the first dean of the College. In reports of the federal courts, and of the several American State jurisdictions, and in English, Scotch, Irish, Canadian, Australian, and English colonial reports, the law library is practically complete to date.

The Library of the College of Agriculture, in the basement of Stone Hall, is open on week days from 9 A. M. till 5 P. M., except Saturday, when it is closed at 1 P. M. In it will be found a large collection of bulletins and reports of experiment stations, reference books on agriculture and country life, agricultural periodicals, and the like. The entomological library, in the department of entomology on the fourth floor of Roberts Hall, is one of the most complete of its kind in the United States. Nearly all of the departments in which instruction is given have well-selected departmental libraries.

SAGE CHAPEL

Religious services are conducted in Sage Chapel throughout the academic year by clergymen of various religious denominations. There will be services in the Chapel on five Sundays during the Summer Session, July 13 to August 10 inclusive.

LECTURES: MUSICAL RECITALS: EXCURSIONS

In addition to the regular classroom work there will be general public lectures on Monday evenings, and also lectures of general interest each week in connection with the work of various departments. They will all be announced in the Weekly Calendar.

Organ recitals will be given on Tuesday evenings in Sage Chapel and on Sunday evenings in Bailey Hall. A piano lecture-recital will be given each week.

Two concerts by distinguished artists will be given in the course of the session; see the Calendar on page 3. Students can buy tickets for these concerts at reduced rates.

Wednesday evenings are devoted to the departmental conferences, which are open to all interested persons. Notice of these conferences will be given from week to week.

Excursions, in connection with the work of certain departments, are made to many points of interest. Some of them are open to all members of the Summer Session. Especially noteworthy are the excursions to Watkins Glen and to Niagara Falls.

RAILROAD ROUTES TO ITHACA

Ithaca can be reached from New York City by either the Delaware, Lackawanna & Western or the Lehigh Valley Railroad. On both roads there are good trains, with Pullman cars, both night and day. Passengers from the west reach Ithaca by way of the Lehigh Valley Railroad from Buffalo. From stations on the Boston & Albany Railroad, the shortest route to Ithaca is by way of Syracuse and Auburn. From Philadelphia, and from Baltimore, Washington, and the south by way of the Baltimore & Ohio, the Philadelphia & Reading connects with the Lehigh Valley at Bethlehem. From stations on the Erie, connection with Ithaca can be made either by the Lackawanna at Owego or by the Lehigh Valley (Elmira and Cortland branch) at Elmira. Ithaca has connections with the New York Central at Geneva, Auburn, and Canastota.

COURSES OF INSTRUCTION

In this list the names of the departments of instruction are in alphabetical order. There is an index on page 69.

Most of the courses consist of five exercises a week, or one hour each week day except Saturday. The number of actual hours of class work in any course can be found by multiplying the number of weekly exercises by six.

The word *hour* when used with reference to University credit means the equivalent of one class exercise a week for a half-year or one semester. One hundred and twenty such hours are required of candidates for the A.B. degree.

GS signifies *Goldwin Smith Hall*.

ASTRONOMY

S 1. GENERAL ASTRONOMY. Credit two or three hours. Lectures and recitations, daily, 8. *Lincoln* 39. Laboratory, T or Th, 2 to 4, *Lincoln* 36, and observations at the *Observatory* at least one clear night each week from 7:30 till 9:30. Professor BOOTHROYD.

A general introductory course intended especially for teachers who may wish to prepare more thoroughly for teaching general science or geography. The lectures are illustrated by models and by lantern slides and the 12-inch equatorial and other instruments of the *Observatory* are used for observation and instruction. Tancock's *Elements of Descriptive Astronomy* and Young's *Elements of Astronomy* are used for reference.

CHEMISTRY

The courses announced below correspond entirely or in part with courses given during the regular sessions of the University. For regular students the requirements for admission to the various courses will be the same as during the year.

Teachers may be admitted to any course for which their general training or experience may be considered to prepare them. Every effort will be made to meet the individual needs of teachers by arranging and modifying the work as far as possible so as to fulfill the particular requirements in each case.

All courses in chemistry are given in the *Baker Laboratory of Chemistry*.

S 101. INTRODUCTORY INORGANIC CHEMISTRY. Credit for a, b, and c, six hours.

(a) Lectures, daily except Sat., 12. *Main Lecture Room*. Professor BROWNE and Mr. MOORE. The lectures deal with the fundamental theories and laws of chemistry, and with the more common elements and their compounds. They are profusely illustrated by experiments. The course is primarily designed to meet the needs of teachers in secondary schools, and to that end emphasis is laid upon methods of lecture presentation and experimental demonstration. Students other than teachers must, before registering, satisfy the department that they are properly prepared to carry on the work.

(b) Laboratory work, M W, 8-12, and T Th F, 9-12. *Room* 150. Dr. McKINNEY and Mr. WILLISFORD. A series of experiments designed to illustrate the fundamental laws of chemistry and to acquaint the student with the properties of the principal elements and their compounds. For the benefit of teachers who may take the course special attention will be given to the methods of laboratory instruction, quantitative experiments, and the blowing of simple glass apparatus.

(c) Recitations. T Th F, 8. *Room* 22. Dr. McKINNEY. The recitations deal with the subject matter of the lectures and with the experimental work in the laboratory; thorough drill in the solution of chemical problems.

S 205. INTRODUCTORY QUALITATIVE ANALYSIS. Lectures, recitations, and laboratory practice. Credit six hours. Lectures and recitations, daily except S.,

8. *Room 107.* Mr. COREY. Laboratory, daily except S., 2-4:30, and M F W, 9-12, *Room 50.* Mr. COREY and Mr. AUDRIETH.

The properties and reactions of the common elements, and of the common inorganic and organic acids; the qualitative analysis of a number of solutions and solid compounds.

S 210. INTRODUCTORY QUALITATIVE ANALYSIS. Shorter course. Lectures and laboratory practice. Credit three hours. Lectures, M W, 11. *Room 107.* Mr. COREY. Laboratory, daily except S., 2-4:30. *Room 50.* Mr. COREY and Mr. AUDRIETH.

The properties and reactions of the common elements and acids, and their detection in various liquid and solid mixtures.

S 220. INTRODUCTORY QUANTITATIVE ANALYSIS. Lectures, recitations, and laboratory practice. Credit six hours. Lectures and recitations, daily except S., 8. *Room 207.* Assistant Professor NICHOLS. Laboratory, daily except S., 9-1. *Room 277.* Assistant Professor NICHOLS and Mr. FONDA.

The preparation and standardization of various volumetric solutions, and their use in analyzing a variety of substances; gravimetric methods, stoichiometry.

S 225. INTRODUCTORY QUANTITATIVE ANALYSIS. Shorter course. Lectures and laboratory practice. Credit three hours. Lectures, T Th, 11. *Room 207.* Assistant Professor NICHOLS. Laboratory, daily except S., 8-11. *Room 277.* Assistant Professor NICHOLS and Mr. FONDA.

The preparation and use of volumetric solutions and work in elementary gravimetric analysis.

S 230. ADVANCED QUANTITATIVE ANALYSIS. Recitations and laboratory practice. Credit two to four hours. Laboratory, daily except S., 8-1. *Room 277.* Assistant Professor NICHOLS and Mr. FONDA.

Gravimetric, volumetric, and electrolytic methods of analysis, and methods of combustion analysis; the calibration of weights and volumetric apparatus, analysis of iron and steel, alloys, silicates, etc.

S 305. INTRODUCTORY ORGANIC CHEMISTRY.

A. Aliphatic Compounds. Credit three hours. Lectures and written reviews. Daily, 9. *Room 207.* Professor ORNDORFF and Mr. LACEY.

B. Aromatic Compounds. Credit three hours. Lectures and written reviews. Daily, 8. *Room 202.* Open to those who have had or who are taking S 305 A. Mr. CORNWELL and Mr. LACEY.

The lectures discuss systematically the more important compounds of carbon, their occurrence, methods of preparation, reactions, relations, and uses.

S 310. INTRODUCTORY ORGANIC CHEMISTRY.

A. Aliphatic Compounds. Credit one to three hours. Laboratory practice and oral reviews. Open to those who have had or are taking S 305 A. Hours to be arranged. Mr. CORNWELL and Mr. LACEY.

B. Aromatic Compounds. Credit one to three hours. Laboratory practice and oral reviews. Open to those who have had or are taking S 305 B and S 310 A. Hours to be arranged. Mr. CORNWELL and Mr. LACEY.

The student prepares a large number of typical compounds of carbon, and familiarizes himself with their properties, reactions, and relations. It is recommended that S 305 A and S 310 A be taken in one summer, and that S 305 B and S 310 B be taken in the following summer. In exceptional cases S 305 A and S 310 A, and S 305 B but not 310 B may be taken together by special permission.

S 320. ADVANCED ORGANIC CHEMISTRY. Credit two or more hours. Laboratory practice at hours to be arranged. Professor ORNDORFF and Mr. CORNWELL.

The course in the preparation of organic compounds is here continued, the preparations, however, being more difficult, and requiring more skill and experience on the part of the student.

S 330. THE COAL TAR DYESTUFFS. Credit two to four hours. Laboratory practice. Hours to be arranged. Professor ORNDORFF and Mr. CORNWELL.

Various intermediate products used in the preparation of dyes are made and from these, representatives of the different groups of dyestuffs are prepared and studied.

S 340. METHODS OF ORGANIC ANALYSIS. Credit two or more hours. Laboratory practice. Hours to be arranged. This course presupposes courses in introductory organic chemistry and introductory quantitative analysis. Professor ORNDORFF and Mr. CORNWELL.

This course comprises the qualitative and quantitative analysis of pure organic compounds, and of such commercial products as alcohols, ethers, organic acids, glycerol, formalin, acetates, soaps, turpentine, rosin, oils, etc.

S 375. INTRODUCTORY ORGANIC CHEMISTRY. SHORTER COURSE. Aliphatic compounds. Lectures and recitations. Daily, 9. Room 202. Professor ORNDORFF and Mr. LACEY. Aromatic compounds. Lectures and recitations. Daily, 10. *Morse C*, during the latter half of the session only. Mr. CORNWELL and Mr. LACEY.

Required of students in the Department of Home Economics. Credit four hours for lectures and recitations.

Laboratory practice at hours to be arranged. Credit one or two hours. Mr. CORNWELL and Mr. LACEY.

This course is primarily designed for students preparing for the study of medicine, who are required to take the whole six hours.

S 405. INTRODUCTORY PHYSICAL CHEMISTRY.

A. Credit three hours. Lectures, daily, 8, and two other lectures at hours to be arranged. Room 7. Assistant Professor BRIGGS and Mr. ————. A systematic presentation of modern chemical theory. The subject matter includes: atomic and molecular theory; gases, liquids, and solids; the theory of solution; colloid chemistry and adsorption; reaction velocity, catalysis, and equilibrium in homogeneous systems; application of physicochemical principles to actual practice.

B. Credit three hours. Lectures, daily, 9, and two other lectures at hours to be arranged. Room 7. Assistant Professor BRIGGS and Mr. ————. A continuation of Part A. The subject matter includes the phase rule and its applications; thermochemistry; electrochemistry; photochemistry; application of the principles of physical chemistry to actual practice.

S 410. PHYSICAL CHEMISTRY LABORATORY. A. Credit three hours. Laboratory practice, daily except Sat., 8-1. Room 1. Assistant Professor BRIGGS and Mr. ————. Open to those only who have taken or are taking Course S 405 A or its equivalent. With the data obtained in the laboratory as a basis, detailed reports are written covering each of the following topics: calibration of volume-measuring apparatus; molecular weight determination by vapor density, boiling point and freezing point methods; vapor pressure; viscosity; distillation of liquid mixtures.

B. Credit three hours. Laboratory practice, daily except Sat., 8-1. Room 1. Assistant Professor BRIGGS and Mr. ————. Open to those only who have taken or are taking Course S 405 B or its equivalent. The course is a continuation of Part A. The following topics are considered: dissociation; solubility; reactions; reaction velocity and catalysis; indicators; thermochemistry; diffusion; colloids and adsorption; photochemical reactions; phase rule studies of inversion points: solid-liquid, liquid-liquid, compounds.

S 465. LABORATORY PRACTICE IN PHYSICAL CHEMISTRY. Credit one to three hours. Laboratory periods to be arranged. Assistant Professor BRIGGS and Mr. ————.

This course is designed to afford opportunity for special laboratory practice in physical chemistry, colloid chemistry, or electrochemistry.

S 195, S 295, S 395, S 495. RESEARCH. Credit one to six hours. Senior chemists, and others by special permission, may elect research in the fields of Inorganic, Analytical, Organic, or Physical Chemistry under the direction of some member of the staff of instruction.

S 180. **TEACHERS' COURSE IN CHEMISTRY.** Daily except Sat., 10. *Rockefeller C.* Credit two hours. Dr. MCKINNEY. Lectures, discussions, and conferences concerning the teaching of chemistry in the secondary schools.

DRAWING AND PAINTING

S 1. **COLOR FROM STILL LIFE.** Daily except Sat., 8-10. *Franklin.* Assistant Professor STONE and Professor ADAMS.

Instruction will be given in one or more of the following media: oil, water-color, pastel.

S 2. **OUTDOOR SKETCHING.** Daily except Sat., 2-4. *Franklin.* Assistant Professor STONE.

Sketching from nature in oil or in watercolor. Only those who submit original work in one of these media will be admitted to this class.

S 3. **DRAWING FROM ANTIQUE.** Daily except Sat., 2-4. *Franklin.* Professor ADAMS.

Instruction will be given in charcoal drawing from casts.

ECONOMICS

The following courses are designed to meet the needs of three classes of students in the Summer Session: (1) those desiring regular college credit for general economics; (2) students with special interests in economic subjects; (3) students seeking broad preparation for the teaching of economics in secondary schools. For the first group, Course S 1 covers the subject-matter usually included under elementary economics. For Cornell students Course S 1 satisfies the economics requirement in the College of Engineering and will also serve in lieu of Course 51 as a prerequisite for admission to various advanced courses in Economics. Graduate students wishing to pursue special investigations will be afforded assistance by members of the Summer Session staff of instruction and by other members of the Department of Economics of the University who may be in residence in Ithaca during the summer.

S 1. **PRINCIPLES OF ECONOMICS.** Credit four hours. Twice daily except Sat., 11 and 12. *GS A.* Messrs. KENDRICK, HUDGINS, and ———.

A general introduction to economics, covering the fundamental principles of value and the distribution of wealth, together with the elements of money and banking.

S 3. **INDUSTRIAL HISTORY.** Credit two hours. Daily except Sat., 9. *GS 242.* Professor STEPHENS.

A survey of the evolution of industry from the Industrial Revolution to the present day; the development of modern forms of organization and the effect of industrial changes on the welfare of society.

S 4. **INTRODUCTION TO THE STUDY OF SOCIETY.** Credit two hours. Daily except Sat., 10. *GS 124.* Professor HANKINS.

A study of social origins and evolution, with special attention to the primary social institutions and the main factors in cultural change.

S 5. **POPULATION.** Credit two hours. Daily except Sat., 11. *GS 124.* Professor HANKINS.

A study of current theories of population as regards both quantity and quality. Special attention will be given to: factors affecting birth rates; theories of race purity, mixture, and decay; and individual differences in relation to differential birth and death rates.

S 7. **CORPORATION AND INVESTMENT FINANCE.** Credit two hours. Daily except Sat., 10. *GS 264.* Professor REED.

A study of the financial problems of the business corporation from the points of view both of the management and of the interested investor.

S 8. **RECENT FINANCIAL HISTORY.** Credit two hours. Daily except Sat., 11. *GS 264.* Professor REED.

The period studied will be that beginning with the banking reform movement after the crisis of 1907.

S 9. RAILWAY TRANSPORTATION. Credit two hours. Daily except Sat., 8. GS 242. Professor STEPHENS.

History and principles of transportation; competition, co-operation, and combination; theories of rates; state and federal regulation; war and post-war problems of transport.

EDUCATION

Courses S 1, S 2, S 3, and S 4, will be found especially helpful to college graduates who are preparing for examinations in professional subjects as outlined in the New York State Syllabus and Course of Study for the renewal of the College Graduate Certificate Limited. The State Department of Education will hold an official examination for such candidates at Ithaca on August 14 and 15.

Under certain conditions teachers may waive the state examination by completing an approved course of study in the Summer Session. Information regarding details of such a course may be had by consulting Professor R. H. JORDAN, Goldwin Smith Hall 121, either in person or by letter.

S 1. EDUCATIONAL PSYCHOLOGY. Credit two hours. Daily except Sat., 10. GS 256. Professor TOWNSEND.

A study of the learning process and its application to educational theory and practice; the original nature of man, reflex action and instinct; the acquisition of habits; attention, memory, association, and thinking; fatigue, individual differences, and social co-operation. The textbook used in this course will be Gates's *Psychology for Students of Education*.

S 1 a. SUPPLEMENT TO S 1. Credit one hour. Time to be arranged. GS 248.

For students in need of three hours' credit in the subject. Discussions, reports, and assigned readings.

S 2. PRINCIPLES OF EDUCATION. Credit two hours. Daily except Sat., 12. GS 256. Professor LIVERS.

A study of education from the sociological point of view, the biological and psychological bases: the problem of aim; formal discipline; social and personal objectives; the studies and their functions; the administrative curriculum; especial reference is made throughout to secondary education.

Textbook: Inglis, *Principles of Secondary Education*.

S 2 a. SUPPLEMENT TO S 2. Credit one hour. Time to be arranged. GS 248.

For students in need of three hours' credit in the subject. Discussion, reports, and assigned readings.

S 3. HISTORY OF EDUCATION. Credit two hours. Lectures, recitations, and prescribed readings. Daily except Sat., 11. GS 256. Professor TOWNSEND.

The purpose of this course is to give an understanding of present educational values and practices through an historical consideration of their origin and development.

The topics treated are to a great extent those emphasized in the syllabus for the New York State Teachers' Certificate; education in primitive and barbaric societies; the rise of the school as an institution; Greek and Roman education; scholasticism, humanism, and realism; the 'psychological' movement; the origin and nature of specifically modern tendencies in education.

Textbook: Monroe, *A Brief Course in the History of Education*.

S 3 a. SUPPLEMENT TO S 3. Credit one hour. Time to be arranged. GS 248.

For students in need of three hours' credit in the subject. Discussions, reports, and assigned readings.

S 4. SECONDARY SCHOOL METHODS. Credit two hours. Daily except Sat., 8. GS 256. Professor JORDAN.

A study of the principles underlying teaching in the secondary school; methods of class instruction; interest and effort; questioning; lesson assignment; lesson plans; class and school management; supervised study; socialized instruction; the project. The course is planned to meet the New York State Certificate re-

quirement in general method, and is adapted especially to the needs of younger and relatively less experienced teachers.

Textbook: Colvin, *An Introduction to High School Teaching*.

S 5. HIGH SCHOOL ADMINISTRATION. Credit two hours. Daily except Sat., 10. GS 120. Professor LIVERS.

A study of the principles basic to administration of the senior and junior high school; the course of study; principles of election; classification of pupils; use of intelligence and achievement tests; the principal as supervisor; building problems; selection and rating of teachers; schedule-making; problems growing out of the experience of the class. Cubberley's *The Principal and His School* will be used as a basis for discussion.

S 6. CLASSROOM TESTS AND MEASUREMENTS. Credit two hours. Daily except Sat., 11. GS 128. Assistant Professor SMITH.

Use of educational measurements and standard scales in the solution of typical educational problems; class and individual diagnosis in the light of achievement-tests; remedial measures following such diagnosis.

Textbook: Monroe, *Measuring the Results of Teaching*.

S 7. MENTAL MEASUREMENTS. Credit three hours. Lectures, prescribed readings, and laboratory. Daily except Sat., 9. GS 256. Laboratory, T Th, 2-4:30. GS 248. Mr. GILBERT.

The first half of this course furnishes a general introduction to the psychology and practice of mental tests. The lectures deal with the historical development of tests; the principles underlying their formation and application; the single tests and the test systems; a detailed study of the principles and use of the Stanford Revision of the Binet-Simon Scale; a brief consideration of the measures of central tendency, variability, and correlation; the bearing of tests upon the problems of psychological theory (nature and distribution of intelligence, the correlation of abilities, etc.). The laboratory work is intended to give practice in administering tests, both to individuals and to groups.

The second half of the course will consider the use of the tests in schools for the diagnosis of defective and exceptional abilities; the causes, frequency, and consequences of mental deficiency; the social and educational treatment of defective, delinquent, retarded, superior, and psychopathic children.

Textbooks: Terman, *The Measurement of Intelligence*. Woodrow, *Brightness and Dullness in Children*.

Laboratory Manual: *Intelligence Tests and their Use*. (Twenty-first Year-book of the National Society for the Study of Education).

S 8. FOUNDATIONS OF METHOD. Credit two hours. Daily except Sat., 12. GS 128. Professor MOORE.

This course is designed primarily for experienced elementary and high school teachers and supervisors. It will include a critical examination of current and proposed educational methods in the light of accepted principles of educational psychology. Special attention will be given to the theories involved in project-teaching. The course will include such topics as the laws of learning, interest and effort, the thinking process, the organization of experience, the relationship between subject matter and the educative process, discipline and moral training.

S 9. ADVANCED WORK IN EDUCATION. Hours and credits to be arranged. GS 248. Professor JORDAN and the other members of the staff.

As a prerequisite for this course one of the courses S 2, S 3, or S 7, or an equivalent, is necessary. The work may consist either of essays and reports upon some special topic, or of laboratory practice of an advanced grade. A seminary will be held if application is made by a sufficient number of advanced students.

S 10. PROBLEMS IN SCHOOL ADMINISTRATION. Credit two hours. M W, 2-4. GS 248. Professor JORDAN.

A study of administration of school systems, and of problems of the secondary school in particular; evaluation and improvement of teaching and of curricular offerings; extra-curricular activities; the administrator and the community.

Open to graduate students and to teachers of experience who have had previous courses in education. Papers and reports required.

S 11. VISUAL INSTRUCTION. Credit two hours. Daily except Sat., 11. GS 134. Mr. ABRAMS.

The psychological basis for the use of visual aids in instruction; the relation of pictures to the imagination, to interest, and to effort; the fundamental distinctions between language and picture expression; the place and limits of each; essentials of the visual method; relation to particular studies; the equipment needed and how to use it; the extent to which the method may be used with profit; types of visual aids and the special value of each; standards for selection of pictures; how to read pictures. Demonstration lessons, conferences, criticisms of particular pictures, exhibits.

See also Geography and Geology, Course S 12 a.

S 12. SEMINARY IN VISUAL INSTRUCTION. Credit two hours. M W F, 9. GS 134. Mr. ABRAMS.

This course is intended for those interested in the selection, organization, and distribution of visual aids to instruction and in the supervision and direction of their use, including producers, members of bureau staffs, principals of schools, supervisors, and librarians. Topics: educational and pictorial standards for selection (more technical than in course 11); accessioning, classifying, labeling, and filing; work of special bureaus of visual instruction, school systems, and libraries; practical schemes of distribution; aims and methods in supervision; discussion of truthfulness, authenticity, quality, expressiveness, and attractiveness as applied to pictures; criticisms of book illustrations; equipment needed.

This course will be adapted to the special needs of the persons taking it.

TEACHERS' COURSES IN HIGH SCHOOL SUBJECTS

The following courses are offered for teachers desiring to study problems of instruction in different high school subjects. The courses are planned also to meet the requirements of the New York State Department of Education in the issuance of the College Graduate Life Certificate.

TEACHERS' COURSE IN CHEMISTRY. See Chemistry S 180.

TEACHERS' COURSE IN ENGLISH. See English S 5.

TEACHERS' COURSE IN GEOGRAPHY. See Geography and Geology S 12a.

TEACHERS' COURSE IN HISTORY. See History S 17.

TEACHERS' COURSE IN LATIN. See Latin S 1.

TEACHERS' COURSE IN MATHEMATICS. See Mathematics S 20.

TEACHERS' COURSE IN MUSIC. See Music S 21.

TEACHERS' COURSE IN PHYSICS. See Physics S 90.

TEACHERS' COURSE IN PUBLIC SPEAKING. See Public Speaking S 3, S 9.

TEACHERS' COURSE IN ROMANCE LANGUAGES. See French S 29, and Spanish S 30.

RURAL EDUCATION

The attention of teachers is called to the courses in Rural Education under the head of Summer School of Agriculture.

TRAINING COURSE FOR PSYCHOLOGICAL EXAMINERS

By recent legislative enactment of the State of New York, special classes for defective children must be formed whenever ten or more such cases are found in any school district. A similar law is operative in New Jersey, and like requirements are being made in other states. Not only is there a considerable consequent demand for teachers trained in the examination and instruction of defectives, but with the increasing recognition of the extent and importance of individual differences in endowment, there is increasing recognition of the usefulness of familiarity with the methods and interpretation of psychological examinations, not only for the mentally backward and subnormal, but also for the normal and supernormal, and in other fields than that of education.

To assist in meeting these various needs, the departments of Education and Psychology call special attention to courses in Introductory, Experimental, and Educational Psychology, and to the course in Mental Measurements. The latter has been expanded to give a thorough training in administration of tests, and in the evaluation and application of results. Students who wish to enter this

course with a view to educational and field service, are advised to register for such additional courses in Psychology as may be helpful in providing an adequate understanding of psychological principles and methods of investigation. Advice in the selection of courses with regard to the individual needs of the student may be had by consulting Professor R. M. OGDEN, Goldwin Smith Hall 246, either in person or by letter.

ENGINEERING

The courses in engineering described below are equal in character to corresponding courses given in the College of Engineering during the regular session. They will be accepted for credit towards graduation by the several schools of the college as far as they apply to the prescribed work of the school concerned. Students in the College of Engineering who may desire to offer work done in the Summer Session toward graduation should consult the Director of the School in which they are regularly registered before registering in the Summer Session. Others may obtain full information concerning these courses by applying to the Secretary of the College of Engineering.

SHOP WORK

S 305. MACHINE WORK. Instruction in the operation of various standard machine tools; use of measuring and hand tools; fitting and assembly. Daily, 8-11 or 9-12; daily except Sat., 2-5. Professor WELLS.

The course will be given only if a sufficient number enroll to justify the operation of the shop.

DRAWING

S 3. MECHANICAL DRAWING FOR SECONDARY SCHOOLS. M T Th F, 8-11 and 2-5. *East Sibley* 206. Assistant Professor TOWNSEND.

This course is designed for those who wish to teach mechanical drawing in secondary schools and for those who feel the need of a more complete knowledge of this subject to assist them in teaching shop work. Some of the topics covered are use of instruments, lettering, orthographic and isometric projection, inking, tracing, conventions, and working drawings. Students familiar with these topics may elect a more advanced course.

Students should be provided with a set of drawing instruments, an architect's scale, a 30°-60° and a 45° triangle.

S 123. MECHANICAL DRAWING. M T Th F, 8-11 and 2-5. *East Sibley* 206. Assistant Professor TOWNSEND.

A course in drawing for beginners, covering use of instruments, orthographic and isometric projection, inking, tracing, convention, working drawings.

DESCRIPTIVE GEOMETRY

S 10. DESCRIPTIVE GEOMETRY. Lectures, daily except Sat., 9. Recitations and drawing, daily except Sat., 10-12. *Lincoln*. Assistant Professor POND.

A study of the representation of lines, planes, surfaces, and solids, and their interrelations. Warped surfaces, tangencies, intersections, and perspective. The work is the same as that given in the regular C.E. courses 201 and 202; and the student will receive four hours of credit if he takes the whole course. A three-hour course that does not include perspective, and fulfills the requirements of course 124 of the Sibley School of Mechanical Engineering and the School of Electrical Engineering will also be given from 2-5 P. M., if there are students enough to make up an extra section. The morning and afternoon sessions make it possible to readjust the schedule so as to accommodate nearly all who may wish to take either course.

KINEMATICS

S 313. KINEMATICS. Credit two hours. Must be taken with course S 314 and is the equivalent of course 313. Prerequisite courses, Physics 6, 330, 311, and 312. Five recitations a week on the theory of mechanisms, instant centers, cams, gears, linkages, velocity and acceleration diagrams. Daily except Sat., 9. Assistant Professor ROGERS.

S 314. KINEMATICS DRAWING. Credit two hours. Must be taken with course S 313 and is the equivalent of course 314. Prerequisite courses Physics 6, 330, 311, and 312. Five three-hour drawing periods a week: drawing board application of the theory and principles of course S 6 in the construction of cams and gears, the solution of linkage and instant center problems, and the determination of velocity and acceleration diagrams, etc. M W F, 10-1, T Th, 2-5. Assistant Professor ROGERS.

MECHANICS OF ENGINEERING

The following courses in Mechanics of Engineering are open to students from other universities, subject to the same requirements for admission as are made for Cornell students. Classes are held in *Lincoln Hall*. See the Announcement of the College of Engineering for more detailed description of Courses 220, 221, 223, 330, 331, 332. Professor RETTGER, Assistant Professor CORNELL, Mr. PERKINS, and Mr. WOOD.

S 20. MECHANICS. Credit five hours. Equivalent to C. E. 220. If not enough students register to form a section, credit equivalent to C.E. 220 may be obtained by a combination of S 30 and part of S 32. Recitations, daily, 8 and 11; and two computing periods a week.

S 21. MECHANICS. Work and Energy and Mechanics of Materials. One section. Credit five hours. Equivalent to C.E. 221. Prerequisite course 220 or the equivalent. Recitations, daily, 9 and 12; and two computing periods a week.

S 23. ENGINEERING PROBLEMS. Credit two hours. Equivalent to C.E. 223. Five computing periods a week. Will be given only if enough students register for the course.

S 30. MECHANICS. Credit three hours. One section. Six recitations a week and two computing periods. Equivalent to Sibley 330. Recitations, daily, 8. Computing periods to be arranged.

S 31. MECHANICS OF MATERIALS. Credit four hours. Two sections. Nine recitations and two computing periods a week. Equivalent to Sibley 331. Prerequisite course 220 or 330, or the equivalent. Recitations: Section A, daily, 8, and T Th S, 11. Computations, M W, 2-4:30. Section B, daily, 9, and M W F, 12. Computations, T Th, 2-4:30.

S 32. MECHANICS OF RIGID BODIES. Credit three hours. One section. Six recitations and two computing periods a week. Equivalent to Sibley 332. Prerequisite 330 and 331 or the equivalent. Recitations, daily, 11.

Rotary motion, work energy, friction, and dynamometers; combined stresses, curved beams, built-in beams. Computing periods to be arranged.

HYDRAULICS

240. HYDRAULICS. Credit four hours. Prerequisite courses 220, 221, or 330, 331. Five recitations and three computing periods a week. Six or more demonstration lectures are given in recitation periods. Daily except Sat., 10; M W F, 2-4:30. The Schools of Mechanical and Electrical Engineering will accept this course for 335. Professor SCHODER.

Hydrostatics, including stability of gravity dams, immersion and flotation, gas volumes and pressures; flow of liquids through orifices, nozzles, Venturi meters, pipes, and over weirs; time required to fill and empty tanks and canal locks; simple, compound, branching, and looping pipes; elementary power calculations in common pumping and fire protection problems. Flow of water in open channels. Elementary consideration of modern water wheels.

STRUCTURAL ENGINEERING

C. E. 270. STRUCTURAL DESIGN AND BRIDGE STRESSES. Credit four hours. Lectures, recitations, computations, and drawing at hours to be assigned. *Lincoln* 14 and 29. Prerequisite C.E. 220, 221. Assistant Professor BURROWS.

One-fourth of the course includes structural detail, i.e., the design of a wooden roof truss and other timber joints. The remainder of the course includes dead

load, live load, and impact stresses in simple bridge trusses due to uniform live panel loads, locomotive axle loads, and road roller loads.

C. E. 271. STRUCTURAL DESIGN. Credit three hours. Lectures, computations, and drawing. Daily, at hours to be assigned. *Lincoln 14*. Prerequisite C. E. 270. Assistant Professor BURROWS.

An elementary course in steel design. Complete design, detail drawing, bill of material, and estimate of weight of a steel roof truss, a through and a deck-plate girder bridge.

C. E. 274. BRIDGE DESIGN. Credit three hours. Computation and drawing, daily, at hours to be arranged. Prerequisite C. E. 271. Assistant Professor BURROWS.

Computations and drawing for the complete design of a riveted railroad bridge of six or seven panels, the stresses for which were computed in connection with the previous study of bridge stresses. The computations to determine the sections of all members and of pins, pin plates, splices, and other details as well as of connecting rivets are to be written up in systematically arranged reports. The drawing consists of general plans showing the location of all rivets as well as the composition and relation of all members and connections. The final reports are to give a full list of shapes and plates, and a classified analysis of weight for the span.

C. E. 280. CONCRETE CONSTRUCTION. Credit three hours. Daily, at hours to be arranged. Prerequisite courses C. E. 220, 221, 225, and 226. Assistant Professor URQUHART.

Concrete materials, properties of plain concrete, its making and deposition; elementary theory of reinforced concrete as applied to columns, rectangular beams, and slabs; T-beams reinforced for compression; direct stress combined with flexure.

C. E. 282. REINFORCED CONCRETE BUILDING DESIGN. Credit three hours. Daily, at hours to be arranged. Prerequisite course C. E. 280. This course may be substituted for C. E. 291. Assistant Professor URQUHART.

Design of a reinforced concrete flat-slab building and an investigation of various other types of floor systems for commercial buildings. Complete detail design for one building, including stairways, elevator shafts, penthouses, etc. Working drawings and steel schedules.

C. E. 283. REINFORCED CONCRETE ARCH. Credit three hours. Daily, at hours to be arranged. This course may be substituted for Engineering Design, Course 291f. Prerequisite course 280. Assistant Professor URQUHART.

The design of an arch of reinforced concrete and its abutments; investigations of the arch ring in accordance with the elastic theory (the live loading for maximum unit-stresses in the arch ring, as well as the direction and magnitude of abutment thrusts, being determined by the influence-line method). Computation and drawing.

ENGLISH

Courses S 1 and S 2 taken together will be considered the equivalent of the first term of Course 1 in the regular University session.

Courses in brackets are not given in the summer of 1924, but may be expected in the summer of 1925.

S 1. COMPOSITION. Credit two hours. Daily except Sat., 8. *GS 177*. Mr. GREENE.

A practical drill intended for those who lack proficiency in writing; discussions of the elements and forms of discourse; frequent exercises, mainly expository; personal conferences at hours to be appointed.

S 2. INTRODUCTORY COURSE IN LITERATURE. Credit two hours. Daily except Sat., 9. *GS 164*. Mr. GREENE.

An introduction to the study of literature, dealing chiefly with the shorter poems of Tennyson and of Browning.

S 4. ADVANCED COMPOSITION. Credit two hours. Daily except Sat., 11. *GS 164*. Professor STRUNK.

The planning, writing, and criticism of essays and of other exercises in composition, accompanied by a study of general principles of writing and of questions of English usage. Open only to students who have had one year of college English and to teachers.

S 5. TEACHERS' COURSE. Credit two hours. Daily except Sat., 10. GS 156. Professor NORTHUP.

Lectures, readings, reports, and discussions. Designed for those who are teaching or who expect to teach English in schools. The organization of the high school course in English; methods of treating the works named by the Conference on Uniform Entrance Requirements in English; the teaching of literature in general; supplementary reading for pupils and teacher; the use of the school library and the public library; stage productions; the place of language and grammar in the high school; problems of oral and written composition; the relation of composition to literature and to other subjects in the curriculum.

S 6. NINETEENTH CENTURY POETRY. Credit two hours. Daily except Sat., 11. GS 160. Assistant Professor BROUGHTON.

A study of the poetry of Wordsworth and of Coleridge.

S 7. NINETEENTH CENTURY POETRY. Credit two hours. Daily except Sat., 8. GS 156. Professor CLARKE.

A study and discussion of the most important poems of Shelley and Keats.

S 8. MODERN PROSE. Credit two hours. Daily except Sat., 11. GS 156. Assistant Professor FISKE.

A study of a few representative nineteenth century essays on the theory of prose style; illustrative readings in Newman, Ruskin, Pater, and Stevenson.

S 10. SHAKESPEARE. Credit two hours. Daily except Sat., 9. GS 156. Professor STRUNK.

A study of Hamlet, Othello, Lear, and Macbeth, with stress upon the art of Shakespeare as a playwright.

S 11. AMERICAN LITERATURE. Credit two hours. Daily except Sat., 12. GS 156. Assistant Professor BROUGHTON.

A study of the American poets of the nineteenth century with particular attention to Bryant, Poe, Whittier, Longfellow, Lowell, Holmes, and Emerson. Text: Page, *Chief American Poets*.

S 12. VICTORIAN LITERATURE. Credit two hours. Daily except Sat., 12. GS 164. Assistant Professor FISKE.

A study of some typical Victorian prose and poetry, including essays of Carlyle and Arnold, and poems of Clough, Swinburne, Morris, Rossetti, Arnold, Tennyson, and Browning.

This course does not cover the ground of course S 2.

[S 13. THE ENGLISH NOVEL. Credit two hours. Daily except Sat., 11. GS 164.

A brief historical survey of the novel in English is followed by detailed study and discussion of the novelists of the nineteenth century. This course may serviceably supplement course S 12.]

S 16. THE ENGLISH LANGUAGE. Credit two hours. Daily except Sat., 9. GS 162. Assistant Professor MONROE.

A study of essential features in the growth and development of the mother-tongue. Among the topics considered are: language and grammar in general; some misconceptions about the life of language; the relationships of English; phonetics, with practical exercises; the English vocabulary; inflections; native resources and foreign influences; modern English grammar; syntax; disputed usages; the bearing of historical grammar on present forms and usages, spoken and written.

Recitations, lectures, collateral reading. The course does not require previous knowledge of Old or Middle English.

S 17. RECENT ENGLISH POETRY. Daily except Sat., 10. GS 164. Credit, two hours. Professor CLARKE.

A critical study of the poetical work of Robert Bridges, Rudyard Kipling, W. B. Yeats, Thomas Hardy, Sir William Watson, Sir Henry Newbolt, John Masefield, Alfred Noyes, W. W. Gibson, and Francis Ledwidge. Consideration of other contemporary work, including the "new poetry" and the poetry of the War.

S 18. OLD ENGLISH. Credit two hours. Daily except Sat., 12. GS 162. Assistant Professor MONROE.

This course is intended for students who, lacking the opportunity hitherto, now wish by earnest effort to acquire some knowledge of English in its early form. Lessons in grammar are followed as soon as possible by the reading of easy prose of the time of Alfred the Great.

The course may be taken by undergraduates; and, with additional reading, by graduates as a part of their work for the master's degree. The time of meeting may be changed to suit the convenience of the class.

SEMINARY

S 25. SEMINARY IN ENGLISH LITERATURE. For graduates only. Hours and room to be arranged. First meeting Wednesday, July 9, 3 P. M. *Goldwin Smith* 164. Professor NORTHUP.

Without neglecting the needs of the more mature, the course is designed especially as an introduction to the graduate study of literature. The special topic for the session is Some Principles of the Criticism of Poetry.

GEOGRAPHY AND GEOLOGY

The lecture rooms and laboratories are in *McGraw Hall*. It is the purpose of this department to meet, primarily, the needs of teachers in grammar schools, high schools, normal schools, and colleges. A second aim is to provide courses of practical and cultural value to college students. The work embraces lectures, laboratory, and field instruction in physical, commercial, and regional geography, and in the elements of geology; also educational methods in geography. The environs of Cornell University are rich in phenomena of geographic and geologic interest. Field excursions, consequently, are made an especially important part of the work of this department in the Summer Session. The laboratories are well equipped with apparatus and illustrative material for instruction. The material includes teaching and reference collections of minerals, rocks, fossils, maps, photographs, models, and more than five thousand lantern slides.

Students planning to take work in the department should, if possible, consult the instructor and register for courses on Saturday, July 5, at rooms indicated.

The attention of prospective students in the Summer Session who are especially interested in geographic and geologic studies is invited to courses given in other departments, courses which afford opportunities for additional instruction in these studies. Such courses are described in other pages of this pamphlet under the heads of METEOROLOGY AND CLIMATOLOGY, offered in the Summer School of Agriculture; ASTRONOMY; and VISUAL INSTRUCTION. The courses in Visual Instruction are Education S 11 and S 12, and Geography and Geology S 12a; since they deal with the sources, selection, and organization of visual aids to instruction in geography and geology, they will be valuable to persons who teach or are planning to teach either of these subjects.

LECTURE COURSES IN GEOGRAPHY AND GEOLOGY

S 1. PHYSICAL GEOGRAPHY. Credit two hours. Daily except Sat., 9. *Geological Lecture Room, McGraw Hall* (first floor, south end). Professor VON ENGELN.

An introductory course in physical geography, including discussion of the origin and form of the continents; the uplift and denudation of the land; the physiographic functions of the atmosphere, ground water, streams, winds, and glaciers; the glaciation of North America; the elements of oceanography.

The lectures in physical geography are fully illustrated by lantern slides and by wall and globe maps. Students registering in this course are advised to take also the related courses S 8 and S 10.

Entrance Credit for Physical Geography to Cornell University. To secure entrance credit ($\frac{1}{2}$ unit) in Physical Geography it is required that the student attend, complete all required work, and pass the examinations in courses S 1, S 8, and S 10.

S 2. COMMERCIAL GEOGRAPHY. Credit two hours. Daily except Sat., 11. *Geological Lecture Room*. Professor VON ENGELN.

Consideration of the nature, variety, and importance of geographical environment and of natural resources as referred to national coherence and organization, the development of commerce, and the distribution of industries. Lectures and study of texts. The student should gain through this course a broad understanding of the geographic factors that are fundamental to such national problems as conservation, prosperity of different communities, domestic and foreign trade, location and growth of cities.

S 3. THE REGIONAL GEOGRAPHY OF EUROPE. Credit two hours. Daily except Sat., 8. *Geological Lecture Room*. Professor BROWN.

The course covers all the countries of Europe; first as portions of the larger regions of the continent; then as national unities. The topics include the geographic factors of the present problems, war geography, re-adjustments to the newer conditions, development of the new states, political versus national regions, economic status of the new and old states.

S 4. GEOGRAPHY AND HUMAN CULTURE; LANDS AND PEOPLES. Credit two hours. Daily except Sat., 10. *Physical Geography Laboratory*. Professor BROWN.

This course is intended as a broad study of certain phases of geography only lightly touched on in general courses. It deals with the peoples of the earth and their unions into communities; the movements or migrations of peoples, the causes and the consequences; a study of primitive and backward peoples together with the conditions which retard their development; advanced peoples; the problems of populations, dense and sparse; the changes incident to a supersaturated population; the development of urban communities; comparative merits of city growths; occupational densities of population; and allied topics. Many of the problems dependent on races and populations are intimately connected with the study of geography; some knowledge of the tendencies of these problems, if not their solutions, is presented. In addition to the general informational value of the study, the course should prove especially helpful to teachers of geography in the grades and secondary schools.

S 5. GEOLOGY. Credit two hours. Daily except Sat., 10. *Geological Lecture Room*. Associate Professor MONNETT.

An introductory course in geology, consisting of lectures and assigned readings upon the following topics: origin of the earth; geologic history of the earth; materials of the earth's crust and their arrangement, as well as the forces modifying them; vulcanism, earthquakes, and similar phenomena; development of life on the earth.

The lectures will be illustrated with lantern slides, models, maps, and specimens. Students registering for this course are urged to take the laboratory Course S 9 and, if possible, Course S 10. Credit for Geology course 1, regular session, will be allowed only for successful completion of all three courses S 5, S 9, S 10.

S 6. MINERAL RESOURCES. Credit two hours. Daily except Sat., 8. *General Geology Laboratory*. Associate Professor MONNETT.

A course in which the principal mineral resources both metallic and non-metallic of the United States will be discussed with reference to the following points: distribution, mode of occurrence, uses, relative importance, rank of the United States among nations of the world in production, and the influence of the various deposits upon the development of the regions in which they occur.

An exceptionally complete collection of specimens is available as illustrative material for this course.

LABORATORY AND EXCURSION COURSES IN BOTH GEOGRAPHY AND GEOLOGY

S 8. PHYSICAL GEOGRAPHY, LABORATORY COURSE. Credit one hour. T Th, 2-4. *Physical Geography Laboratory*. Professor LEIGHTON, Miss BROTHERHOOD, and Miss MATTSON.

The members of this class will make a systematic study of the physiographic regions of the United States, using contour maps, models, and the experimental laboratory of the department in a laboratory study of the subject. By such study of the topographic, regional, and life relationships (human, animal, and plant) the geography of the United States will be correlated and presented as an orderly whole. The course will prove of worth to grade teachers of geography who wish to obtain a broader basis for their work in the subject as well as for those who expect to teach geography in the high schools.

A laboratory fee of \$1 must be paid to the Treasurer at the beginning of the session to cover laboratory maintenance.

S 9. GEOLOGY, LABORATORY COURSE. Credit one hour. W F, 2-4. *General Geology Laboratory.* Professor LEIGHTON, Miss BROTHERHOOD, and Miss MATTSON.

This course is designed to supplement course S 5. A study will be made of the more common structural phenomena; of the interpretation and uses of geological maps; of characteristic life forms developed in different geologic periods; and of the more common rocks and minerals. Short field excursions will be made to collect both rock specimens and fossils.

A laboratory fee of \$1 must be paid to the Treasurer at the beginning of the session to cover laboratory maintenance.

S 10. GEOGRAPHY AND GEOLOGY, FIELD COURSE. This course should be elected by all those registering in Course S 1 or S 5 and is required of all those who desire entrance credit in physical geography. With courses S 1 and S 8 it affords a comprehensive course in physical geography; with courses S 5 and S 9 it will give a similarly broad training in elementary geology, as the dynamic phases of geology are emphasized on the excursions. Mimeographed outlines of the excursions are to be secured by each student desiring credit. Professor LEIGHTON, Miss BROTHERHOOD, Miss MATTSON.

Those desiring University or entrance credit must take field notes and hand in written reports. Excursions 1, 2, 3, 4, 5, are required of all students in the course, and in addition for one hour's credit they must make their own choice, two of 7, 8, 11, or may substitute for these two, excursion 10.

Meeting place and time announced in mimeographed outlines or by bulletin. Meet for first excursion, Monday, July 14, at McGraw Hall, 2:15 p. m. or East Ithaca R. R. Station, 2:30 p. m. Excursions 1-5, Monday afternoons; 7, 8, 11, all day Saturday; 10 starts on Saturday. On the excursions to which a cost is attached, persons wishing to go must register at the department and secure tickets in advance of the date of the trip.

The longer excursions will be in charge of Professor LEIGHTON, with the co-operation and assistance of the other members of the instructing staff. On the excursions stops will be made at points of interest, explanations made, questions asked, and discussion invited.

OUTLINE OF EXCURSIONS: COURSE S 10

Monday Afternoons

1. **EAGLE HILL.** To become acquainted with the lie of the land about Cornell, to learn the place names of the broader physiographic features, studying en route processes of weathering, and, at the summit, the maturely dissected plateau. The top of the hill is a vantage point from which a good view of the lake and the land for miles to the north, east, and west may be had. July 14.

2. **FALL CREEK AND DEADHEAD HILL.** To study the origin and nature of sedimentary rocks, also processes of erosion, transportation, deposition, and cementation. An intimate view of one of the large gorges and its especial features, particularly Ithaca Falls. July 21.

5. **TERMINAL MORAINNE.** North Spencer. By train or auto-truck. To study a massive morainic loop, the basin in which the former ice tongue rested, and the outwash deposits and overflow channels to the south. Truncated valley sides due to glacial erosion. The most striking examples of glacial phenomena in the Cornell region. July 28.

3. **SHORE OF CAYUGA LAKE.** To study shore-line phenomena, joint planes, bedding, and stalactite formation. A walk for several miles along the east shore of the Lake. August 4.

4. **PORTLAND POINT.** By Auto Truck. To study rock structure; intrusion of igneous rocks into sedimentary formations; rock-folding and small scale faulting and associated phenomena; vein-formation; fossil content of strata; economic utilization for cement. Report must be handed in not later than two days after the excursion. August 11.

All-day Excursions

7. **TAUGHANNOCK GORGE AND FALLS.** By steamer. To study the Inlet Plain, its reclamation, the Barge Canal terminal, the position and succession of the Devonian strata along the lake shore and the deep gorge and falls of Taughannock, one of the highest straight falls east of the Rockies. Luncheon at the foot of the falls. July 19.

8. **ENFIELD GORGE AND FALLS; AND CONNECTICUT HILL.** By auto-truck. To study the relations of preglacial and hanging valleys and the postglacial and interglacial gorges, their origin and features. Joint-plane guidance of stream courses. A ride to the head of the gorge, climb through it to the lower end past the crest of Lucifer Falls. Enfield is perhaps the most picturesque and wildest of the gorges in the Cornell region. Luncheon at the head of the gorge. A ride to the top of Connecticut Hill, the highest point in the region. July 26.

Longer Excursions

10. **NIAGARA FALLS AND GORGE.** By train. Overnight at Niagara Falls. August 2. Open to all students in the Summer Session as far as accommodations are available.

All the important scenic features of Niagara Falls and Gorge are visited and their physiographic history interpreted. As a whole these phenomena constitute a striking record of some of the most interesting chapters in the geologic and physiographic history of North America. Before the trip a special meeting of those interested will be held in the Physical Geography Laboratory, when the relations of the different places will be explained and illustrated by a large scale relief model of the Niagara region. Friday, August 1, 4:30 p. m. Students are advised to send to Director U. S. Geological Survey, Washington, D. C., for a copy of Niagara Folio, No. 190, in octavo form; cost, fifty cents in coin or money order.

11. **WATKINS GLEN.** By auto truck. August 9. Open to all students in the Summer Session, as far as accommodations are available.

Watkins Glen is considered one of the most beautiful scenic spots in the country. It has been secured for a State park by New York and all parts of it made accessible. The excursion party will study the gorge, its pot holes and falls in detail; and consider its relations to the Seneca Lake valley in comparison with the conditions at Ithaca as related to the Cayuga valley. Ride across the dissected upland country to the south and west between Ithaca and Watkins.

S 12 a. **GEOGRAPHY OF NEW YORK STATE.** Daily except Sat., 12. *Geological Lecture Room.* Mr. ABRAMS. This is both a subject-matter and a method course; the *visual method* exemplified in teaching a definite part of the field of geography. A systematic study of the State will be made by physiographic regions with a consideration of the adaptation of each for forestry, pasturage, agriculture, manufacturing, trade, transportation, and recreation. Attention will be called to the general principles of geography that are clearly illustrated in New York State. A distinction will be made between those facts and phenomena that may well be presented to younger pupils as units of measure and standards for comparison in the further study of geography and those to be reserved for upper grades. Full use will be made of screen pictures, photographs, maps, and books of reference, primarily with a view to illustrating how to study and teach geography. As field work is an essential aspect of the visual method, each member of the class will be required to take and report upon three of the Monday afternoon excursions,

Course S 10. The course emphasizes some of the newer features of the State Syllabus in Geography that is now being rewritten. While of special interest to teachers, it is open to all students. The final examination will be differentiated for teachers and for those wanting college credit.

GERMAN

S. 1. FIRST YEAR GERMAN. Grammar, composition, reading, oral training. Daily except Sat., 8 and 12. GS 183. Assistant Professor ANDREWS. Credit, four hours. Entrance credit, one unit.

After successfully completing this course, students can, by supplementary reading during the summer, prepare themselves for the fall entrance examination in second year German.

S 3. THIRD YEAR GERMAN. Reading, grammar, composition, oral training. Daily except Sat., 8 and 12. GS 190. Professor FAUST. Credit, four hours. Entrance credit, one unit (third unit).

Prerequisite: two years of high school German or its equivalent.

S 4. RAPID READING. Daily except Sat., 9. GS 177. Credit, two hours. Assistant Professor ANDREWS.

German texts of literary value will be read and translated, with casual comment upon their literary significance.

Prerequisite: three years of high school German or the equivalent.

S 5. GERMAN LITERATURE SINCE 1880. Daily except Sat., 10. GS 190. Credit, two hours. Professor FAUST.

Lectures in German with collateral reading. Beginnings: the lyric, novel, and drama. Foreign influences. The naturalists. Transition to symbolism. Impressionism. Contemporary expressionism.

GERMAN READINGS. Interpretive readings from modern German literature will be given on Wednesday evenings at 8 o'clock in GS 190 by Professor FAUST.

GOVERNMENT

S 1. AMERICAN GOVERNMENT. Credit two hours. Daily except Sat., 8. GS 245. Assistant Professor SABY.

A study of American Government, national and state, showing the historical development of our political institutions, more particularly their practical operation in meeting the present-day problems of our democracy.

S 3. MUNICIPAL PROBLEMS. Credit two hours. Daily except Sat., 10. GS 245. Assistant Professor SABY.

A study of the city at work and of the problems confronting persons interested in municipal progress.

HISTORY

S 1. ROMAN HISTORY. Credit two hours. Daily except Sat., 11. GS 245. Associate Professor CALDWELL.

This course will be a general survey of Roman History from the earliest times to the fall of the Roman Empire. Although the main emphasis will be laid upon political history, the social, economic, and religious movements will also be discussed. Lectures, collateral readings, and discussions.

S 2. GREECE IN THE FIFTH AND FOURTH CENTURIES. Credit two hours. Daily except Sat., 12. GS 245. Associate Professor CALDWELL.

After a brief survey of the preparatory work of the sixth century, this course treats in some detail the period from the Persian Wars to the death of Alexander. Particular attention is given to social and economic conditions and to the development of culture.

S 3. MODERN EUROPEAN HISTORY. Credit two hours. Daily except Sat., 10. GS 242. Professor BECKER.

A general treatment of the history of Europe since 1815.

S 4. THE FRENCH REVOLUTION. Credit two hours. Daily except Sat., 11. GS 242. Professor BECKER.

A descriptive survey of the institutions of France in the Old Régime, followed by a study of the Revolution from 1789 to 1795.

[S 5. MODERN EUROPEAN HISTORY. Europe from the sixteenth century to 1815.] Not given in 1924.

[S 6. THE NAPOLEONIC ERA.] Not given in 1924.

S 7. ENGLISH HISTORY. Credit two hours. Daily except Sat., 10. GS A. Professor POLLARD.

A general course adapted to the needs of teachers and advanced students.

S 8. ENGLISH HISTORY. Seminary. Hours to be arranged. Professor POLLARD. Open to graduate students and by special permission to others.

[S 11. AMERICAN HISTORY. The expansion of the United States across the Alleghany Mountains, 1750-1848.] Not given in 1924.

[S 12. AMERICAN HISTORY. The Period of Civil War and Reconstruction, 1846-1875.] Not given in 1924.

S 13. AMERICAN HISTORY. The Middle Period, 1815-1860. Credit two hours. Daily except Sat., 10. GS 234. Professor BRETZ.

A survey of the period from the Second War with Great Britain to the opening of the Civil War with special reference to constitutional and political problems. Attention will be paid to the more recent historical literature dealing with the period. The work will consist of lectures and assigned readings.

S 14. AMERICAN CONSTITUTIONAL HISTORY. A study of constitutional questions of present interest. Credit two hours. Daily except Sat., 8. GS 234. Professor BRETZ.

A study of constitutionality of law, citizenship, treaty making, amendments, interstate commerce, and other topics with reference to their history and to their present significance. Readings and discussions.

AMERICAN HISTORY SEMINARY. Sat., 9-11. For students qualified for research. GS 235. Consult Professor BRETZ.

S 17. CONTEMPORARY HISTORY and its teaching in the secondary schools. Credit two hours. Daily except Sat., 9. GS 234. Professor HICKMAN.

This course deals with the history of Europe since the war. The topics studied are the Peace Treaty; the conferences of the premiers; the conferences of the ambassadors; the League of Nations; England; France; Italy; Germany; Austria; Hungary; Czechoslovakia; Jugoslavia; and Poland. Both in method and in content the course will be useful to teachers in secondary schools, especially such as teach the courses in world history prescribed by the new history syllabus of the University of the State of New York.

HYGIENE

S 11. HYGIENE. Credit two hours. Daily except Sat., 8. *Stimson Histology Lecture Room*. Dr. SMILEY.

This is an informational course designed to treat in a general way personal and community hygiene and in a more special way the hygiene of the school child and the school group. The course will be carried on by means of lectures, charts, and frequent quizzes, and an attempt will be made to compensate for the wide scope of the subject by limiting the discussion to those aspects which will be of particular interest or importance to the school teacher.

LATIN

S 1. THE TEACHING OF LATIN IN SECONDARY SCHOOLS. For teachers and those preparing to teach Latin in high or preparatory schools. Daily except Sat., 11. GS 120. Credit two hours. Dr. GRAY.

A study of the valid objectives for secondary Latin and of the content and method which should be employed in the attainment of these objectives. The course will make use of the results of the Classical Investigation, as far as they are available.

S 2. THE MATERIALS OF SECONDARY SCHOOL LATIN. Credit two hours, or the third unit of entrance Latin. For teachers desiring an illustrative treatment of the high school course, and for students who have not yet completed the full entrance requirements. Daily except Sat., 12. GS 120. Dr. GRAY.

A study of third year Latin particularly with reference to classroom technique and alternative materials.

Students wishing entrance credit for the third year of high-school Latin must do supplementary work as required by the instructor, to the extent of five hours a week.

S 3. LATIN EPIGRAPHY. The interpretation of selected Latin inscriptions of the earlier empire. Republican and later imperial, including Christian, inscriptions will be studied primarily with reference to their linguistic importance. Primarily for graduate students, candidates for the Master's degree. Daily except Sat., 9. GS 128. Credit two hours. Professor DURHAM.

S 4. CATULLUS. Interpretation of the poems of Catullus; lyric and elegiac poetry during the republic. Daily except Sat., 10. GS 128. Credit two hours. Professor DURHAM.

NOTE: Those who wish to begin their candidacy for the degree of Master of Arts are requested to correspond in advance with Professor Durham and to bring with them at the opening of the Summer Session such credentials of undergraduate work leading to the degree A.B., as will entitle them to admission to the Graduate School.

MATHEMATICS

In addition to the courses noted below, each teacher will have a daily office hour for consultation with students. It is urged that this opportunity be utilized by all concerned.

In the following list, courses S 1 to S 5 (b) are the equivalent of those having the same numbers in the *Announcement of the College of Arts and Sciences* for 1923-24.

Courses S 1, S 2, S 3 are planned for those teachers in the secondary schools who wish to review these subjects. They are equivalent to the advanced entrance requirements of Cornell University and of the College Entrance Examination Board. They presuppose a ready knowledge of elementary algebra (through quadratic equations) and of plane geometry. University credit for S 1, S 2, S 3, three hours each.

Students taking S 5 (a), S 5 (b) are requested to take no other University work during the session without special permission.

University credit for S 5 (a), S 5 (b), five hours each.

Courses S 4, S 5 are discontinued. Course S 6 will be given only if at least ten students register at White 29.

S 1. SOLID GEOMETRY. Daily, 11. White 25. Professor HUTCHINSON. (Office hour, 12, White 26.) White 5. Assistant Professor CRAIG. (Office hour, 10, White 4.)

S 2. ADVANCED ALGEBRA. Daily, 9. White 27. Professor SHARPE. (Office hour, 11, White 29.) White 1. Assistant Professor WILLIAMS. (Office hour, 11, White 3.)

S 3. TRIGONOMETRY. Daily, 10. White 27. Professor SHARPE. (Office hour, 11, White 29.) White 25. Professor HUTCHINSON. (Office hour, 12, White 26.)

S 5(a) ANALYTIC GEOMETRY AND THE CALCULUS (First term's work). Daily, 8 to 11. White 10. Assistant Professor CARVER. (Office hour, 9, White 12.) White 9. Dr. MORSE. (Office hour, 9, White 12.)

S 5(b) ANALYTIC GEOMETRY AND THE CALCULUS. (Second term's work). Daily, 8 and 11. White 1. Assistant Professor GILLESPIE. (Office hour, 9, White 3.) White 6. Assistant Professor HURWITZ. (Office hour, 9, White 8.) White 2. Assistant Professor OWENS. (Office hour, 9, White 4.) White 21. Mr. BEISEL. (Office hour, 9, White, 23.)

S 20. TEACHERS' COURSE. Credit two hours. Daily except Sat., 11. White 24. Professor SNYDER. (Office hour, 10, White 26.)

The course will comprise selected topics in the subjects of secondary school mathematics, including constructions by ruler and compass and the solution of equations. The mutual dependence of algebra and geometry in the solution of problems will be emphasized.

ADVANCED COURSES

S 62. PROJECTIVE GEOMETRY. Credit three hours. Daily, 9. *White 5.* Assistant Professor CRAIG. (Office hour, 10, *White 4*) The principles underlying projective forms of the first and second degrees will be developed. Although no knowledge of mathematics beyond plane geometry will be presupposed, additional training is highly desirable.

S 42. ANALYSIS. Credit three hours. Daily, 10. *White 2.* Assistant Professor WILLIAMS. (Office hour, 11, *White 3.*) A knowledge of the calculus is presupposed. The content of the course will vary from year to year, according to the needs and desires of the students. Correspondence from possible applicants for the course will be welcome. The subjects to be treated will generally be selected from the following list: elementary differential equations, theory of limits and logical foundations of the calculus, theory of point-sets, infinite series, theory of functions of a complex variable.

READING AND RESEARCH COURSES

In addition to the preceding courses, the teachers of mathematics offer the following opportunities to graduate students. Instruction will consist of conferences by appointment, direction of reading, and proposing definite problems for research.

FUNCTIONS OF A COMPLEX VARIABLE. Professor HUTCHINSON, Assistant Professor CRAIG.

ALGEBRAIC CURVES AND SURFACES. Problems in correspondence and birational transformations. Professor SNYDER.

APPLIED MATHEMATICS. Problems in hydrodynamics: heat, electricity, and elasticity. Professor SHARPE.

FOUNDATIONS OF GEOMETRY AND PROBLEMS IN SYNTHETIC GEOMETRY. Assistant Professors CARVER and OWENS.

FUNCTIONS OF A REAL VARIABLE, POINT-SETS, CALCULUS OF VARIATIONS. Assistant Professor GILLESPIE.

ADVANCED ANALYSIS. Problems in the theory of functions, differential equations, and integral equations. Assistant Professor HURWITZ.

ALGEBRAIC INVARIANTS. Assistant Professor WILLIAMS.

MUSIC

S 10. HARMONY. Credit two hours. Daily except Sat., 8. *Barnes Hall.* A course dealing with the construction and interconnection of triads and chords of the seventh.

S 14. MUSICAL APPRECIATION, FORM, AND DESIGN. Credit two hours. Daily except Sat., 10. *Barnes Hall.* Professor KINKELDEY.

A discussion of musical style; form and content in music. The course is intended to furnish a rational basis for the appreciation of musical masterpieces of all schools.

S 18. HISTORY OF MUSIC. Credit two hours. Daily except Sat., 12. *Barnes Hall.* Professor KINKELDEY.

The historical growth and development of music to the present time.

S 20. MUSIC IN THE PUBLIC SCHOOLS. Credit two hours. Daily except Sat., 9, *Barnes Hall.* Director WEAVER.

An introduction to the general problem of school music: its value as an educational subject; principles underlying classroom methods; practical suggestions for elementary and high school situations.

S 21. GENERAL PROBLEMS OF MUSIC SUPERVISORS. Credit two hours. Daily except Sat., 11. *Barnes Hall.* Director WEAVER.

A discussion of the problems of the supervisor; evaluation of methods and materials; comparison and contrast of systems and textbooks in current use.

CHORUS. The Department of Music will organize and maintain a choir for the service in Sage Chapel at 11 o'clock each Sunday morning during the Summer

Session. The individual tests for this choir will be held in Sage Chapel on Monday July 7 from 9:30 to 12:30 and 2:30 to 5:00. The rehearsals will be held on Thursday at 5 o'clock and on Sunday at 10. All students having voices and desiring to sing are urged to become members of this choir.

PHILOSOPHY

The courses are intended to be of general rather than of technical interest, and may be taken by all students. Candidates for the degree of Master of Arts who have chosen philosophy as a major or a minor subject will find it desirable to take some of these courses as a basis and preparation for more advanced study. Such students will be given individual guidance in their reading.

S 1. HISTORY AND PHILOSOPHY OF THE FINE ARTS. Daily except Sat., 10. GS 225. Credit two hours. Professor HAMMOND.

An introduction to the Philosophy of Aesthetics, including an outline of the history of the plastic and graphic arts.

S 2. GREEK CIVILIZATION. Daily except Sat., 12. GS 225. Credit two hours. Professor HAMMOND.

A history of the chief Greek systems of philosophy and their survival in the Roman Empire and in Christian civilization. Particular attention will be given to the Greek ideals of life as expressed in their literature, art, and political theory and practice.

S 6. MODERN PHILOSOPHY. Credit two hours. Daily except Sat., 9. GS 225. Professor SABINE.

The principal types of philosophical system that appeared during the seventeenth, eighteenth, and nineteenth centuries and their relations to science and to political and social movements.

S 7. THE PHILOSOPHY OF THE STATE. Credit two hours. Daily except Sat., 11. GS 225. Professor SABINE.

The ethical foundations of political liberty and political obligation.

PHYSICAL EDUCATION

SWIMMING. Instruction in swimming and life saving for individual training and for teaching will be given at hours to be arranged for each applicant by appointment. For this instruction a special charge of ten dollars is made. For women, *Sage College Gymnasium*. 9-12 A. M., 2:30-5 P. M. For men, *Armory Gymnasium*, by appointment. Mr. GÉLAS.

EQUITATION. Daily except Fri. and Sat., 8, 9. Major ANDERSON and First Sergeant JENSEN of the Field Artillery Detachment, Cornell University. For this instruction a special charge of twenty dollars is made. Courses in Equitation are open only to students regularly enrolled in the Summer Session.

S 1a. ELEMENTARY CLASS (MEN). Practical equitation and horsemanship; the seats; the aids; work on the track; posting; cross-country riding.

S 1b. ELEMENTARY CLASS (WOMEN). A course more elementary than S 1a yet covering much the same ground. Selected mounts.

S 1c. ADVANCED CLASS. Hours to be arranged. For those who have had experience in riding. The seat; the rein; leg aids; exercises on long lines with and without stirrups; exercises on the circle; posting; the walk, trot, and gallop; jumping; cross-country riding; the care, conditioning, and training of horses.

PHYSICS

DEMONSTRATION LECTURES. A series of experimental demonstrations covering the entire field of Physics. Little time will be spent on the development of the related theory, this being left for the classroom work of the courses described below. Teachers may find in these demonstrations valuable suggestions for their own work. These lectures are a required part of courses S 3 and S 6. Daily, 8. Rockefeller A. Assistant Professor HOWE.

S 3. INTRODUCTORY EXPERIMENTAL PHYSICS. Credit six hours. Demonstration lectures, recitations, and laboratory work. Lectures, daily, 8. Rockefeller A.

Recitations, daily, 9; quiz, M, 10-12. *Rockefeller* 109. Assistant Professor HOWE. Laboratory, three two-hour periods a week. Section A, M, 2-4 and T Th, 10-12; Section B, W F, 10-12 and Th, 2-4. *Rockefeller* 220. Assistant Professor POWER and Mr. STANTON.

S 6. INTRODUCTORY PHYSICS. Credit six hours. Demonstration lectures and recitations. Prerequisites, Mathematics S 1, S 2, and S 3 or their equivalent. Lectures, daily, 8. *Rockefeller* A. Recitations, daily, 9; quiz, M, 10-12. *Rockefeller* 107. Assistant Professor COLLINS.

S 11. GENERAL PHYSICS. Credit three hours. Theory and problems covering selected topics in heat and electricity. It is recommended that Physics S 14 be taken simultaneously with Physics S 11. Prerequisites, Physics S 7, as given in the second term 1922-23 or its equivalent, and calculus. Recitations, daily, 8; quiz, M, 12, or as arranged. *Rockefeller* 106. Mr. NORTHROP.

S 14. PHYSICAL MEASUREMENTS. The schedule of experiments comprising this course may be taken in Physics S 65, which see.

S 55. PHYSICAL EXPERIMENTS. Credit two hours. For teachers of elementary physics and for others wishing a greater familiarity with laboratory work. T Th, 9-11:30 and M W F, 2-4:30. *Rockefeller* 252. Assistant Professor TUCKER.

A general laboratory study of the fundamental physical laws and constants, partly from the qualitative, partly from the quantitative point of view. The work may be varied to suit the interest of the student, since the instruction is in all cases individual. This course presupposes a knowledge of introductory physics.

S 61. ELECTRICITY AND MAGNETISM. Credit two hours. Class work. Prerequisites, Physics S 3 or its equivalent and Trigonometry. Daily except Sat., 12. *Rockefeller* 105. Assistant Professor TUCKER.

A detailed study of the fundamentals and recent developments in the field of electricity primarily for students who are not familiar with calculus.

S 65. PHYSICAL MEASUREMENTS. Credit one to four hours. Primarily for teachers and students who wish a thorough introduction to the theory and methods of physical measurements. Prerequisites, the equivalent of eight hours of college Physics and a knowledge of the elements of calculus. One to four three-hour periods a week. M W F, 2-5 and T Th, 9-12. *Rockefeller* 252. Assistant Professor TUCKER and Mr. MERTZ.

The methods of setting up and adjusting apparatus, the study of sources of error and their elimination, methods of computation, the interpretation of results, both analytically and graphically, have special emphasis. The instruction is individual and the topics covered may be adjusted to meet the needs of the student.

S 90. TEACHERS' COURSE. Credit two hours. Lectures, discussions, and conferences, with emphasis upon the selection, organization, and presentation of subject-matter and practice in the care and manipulation of apparatus in classroom and laboratory. Daily except Sat., 9. *Rockefeller* 108. Assistant Professor POWER.

Conferences, individual or by groups, may be arranged for the discussion of practical problems suggested by members of the class. Teachers are advised to bring with them a copy of the textbook which they are using.

S 105. ADVANCED LABORATORY PRACTICE. Open to students who have had Physics S 65 (four hours of credit) or its equivalent. Credit varies with the amount of work done. The laboratory is open daily except Sat., 9-12. *Rockefeller* 301. Assistant Professor MURDOCK.

This course is intended to meet the requirements of the following classes of students: (1) those wishing to take up special topics for detailed study; (2) those taking Course S 111 or S 130 and desiring to supplement that work in the laboratory; (3) those who wish to develop their laboratory technique in preparation for research.

[The sequence of courses S 111 to S 140 is intended to run through three summer sessions. The schedule for the next three summers is: 1924, S 130 and S 111; 1925, S 121 and S 112; 1926, S 122 and S 140. The courses are of the same

general character as the corresponding courses given in the fall and spring terms but include somewhat fewer topics. The selection of these topics will be influenced by the interests and needs of the class. To profit by these courses a student should have a knowledge of calculus and should have completed courses in general physics covering the principal topics of the subject. A student who contemplates electing any of these courses is advised to correspond with the department about his preparation for the work. These courses, as also S 105, S 170, and S 415, may be taken for credit toward a master's degree in Physics, subject to the requirements of the graduate school. See the *Announcement of the Graduate School*.]

S 111. MECHANICS. Credit two hours. An introductory study of analytical mechanics based upon Jean's *Theoretical Mechanics* and a discussion of terrestrial and universal gravitation. Daily except Sat., 8. *Rockefeller C.* Assistant Professor MURDOCK.

[S 112. PROPERTIES OF MATTER. Elasticity, surface tension; dynamics of fluids, viscosity.] Not given in 1924.

[S 121. ELECTRICITY AND MAGNETISM. Static, electric, and magnetic fields; direct current phenomena; gaseous, electrolytic, and metallic conduction; chemical and thermal electromotive forces.] Not given in 1924.

[S 122. ELECTRICITY AND MAGNETISM. Electromagnetism, variable current phenomena, electric oscillations.] Not given in 1924.

S 130. LIGHT. Credit two hours. Geometrical optics; thick lenses; optical instruments. Physical optics: interference, diffraction, polarization. Houston's *Treatise on Light* will be used as a text. Daily except Sat., 12. *Rockefeller C.* Assistant Professor COLLINS.

[S 140. HEAT.] Not given in 1924.

S 170. INTRODUCTION TO MODERN PHYSICAL THEORIES. Credit two hours. Prerequisite classroom and laboratory work of the grade of S 55 and S 61 and covering the entire field of Physics. A knowledge of calculus is desirable. Daily except Sat., 2-3:30. The course will be completed during the first four weeks. *Rockefeller C.* Professor RICHTMYER.

Lectures and assigned readings. A brief historical summary of the development of Physics up to 1900, followed by a discussion of the electromagnetic theory, photoelectricity, electron theory, radiation and spectra, quantum theory, atomic structure, and allied subjects.

S 415. SPECIAL TOPICS FOR INVESTIGATION. Students who are prepared to profit by the use of the library and laboratory facilities of the department in the study of some special topic or in investigation will be given an opportunity to do so. This work may be taken in connection with or independently of any of the above courses and will be under the direction of one or more members of the staff, with whom frequent conferences should be arranged. Credit varies with the nature and amount of work done.

For further information regarding opportunities for research and investigation during the summer see the *Announcement of the Graduate School*.

PSYCHOLOGY

S 1. PSYCHOLOGY. Credit two hours. Lectures, M T W Th, 9. Professor TITCHENER. Recitations, F 9. *GS C.* Assistant Professors DALLENBACH and HOISINGTON, and Dr. BISHOP.

This course furnishes a general introduction to the study of the normal human mind from the experimental point of view. It opens with the brief discussion of the nature of a scientific psychology, of the problems which such a psychology is called upon to face, and of the methods at its disposal for their solution. It then sets forth in order the facts and laws of mental life as indicated by experiment, beginning with sensation, image, and affection; it passes by way of attention, perception, association, and memory to the highly complex processes of imagination, voluntary action, and thought. Throughout the work use will be made of the unique collection of demonstrational apparatus which composes the equipment of a special laboratory in Goldwin Smith Hall.

Textbook: Titchener, *Textbook of Psychology*.

S 2. ATTENTION. Credit two hours. Daily except Sat., 10. GS C. Assistant Professor DALLENBACH.

In this course the applications of Attention to advertising, to conjuring and sleight of hand, to hypnosis, to testimony, to efficiency, and to learning will receive special emphasis. The application will, however, be made only after the student has been grounded in the elementary facts and laws of Attention. The development, the conditions, the kinds, and the levels of Attention will first be considered; then the experimental investigations will be reviewed; and thereafter the practical considerations will be taken up.

Demonstrations and class-experiments will be used frequently for illustration. No textbook will be prescribed, but the lectures will be supplemented by assigned readings in standard works.

S 3. MEMORY AND LEARNING. Credit two hours. Daily except Sat., 8. GS C. Assistant Professor HOISINGTON.

The chief topics to be treated in this course are: the general nature of memory; the curve of learning; the conditions of impression, association, recall, and recognition; the correlation between different memories and between memory and other mental functions; teaching and the presentation of material; recitation and examination; "cramming" and efficient study; unusual memories and their conditions; the formation and the breaking of habits; mnemonic schemes and the "training" of memory.

Demonstrations and class-experiments will be made throughout the course. Readings will be assigned in standard texts and monographs to be found in the library.

S 4. QUALITATIVE LABORATORY. Credit two hours. M W F, 2:00-4:30. *Psychological Laboratory, Morrill Hall.* Assistant Professor HOISINGTON and Dr. BISHOP.

The purpose of this course is to furnish the student training in psychological method, and to give him a first-hand acquaintance with the contents of his own mind. The laboratory consists of twenty-seven rooms on the upper floors of Morrill Hall, including dark rooms, workshops, and offices. The equipment on the side of apparatus is especially complete, embracing besides the standard pieces for qualitative experiments a great variety of special instruments. The equipment of the research laboratory is also available for demonstrations. Experiments will be performed in vision, audition, and the other departments of sense, in feeling, attention, perception, and idea, and toward the end of the work the student may carry out experiments upon the more complex processes of association and action. The textbook is Titchener's *Experimental Psychology*, vol. i, Qualitative Student's Manual.

S 5. QUANTITATIVE LABORATORY. Credit two hours. Three afternoons (to be arranged), 2:00-4:30. *Psychological Laboratory, Morrill Hall.* Assistant Professor DALLENBACH.

This course aims to furnish such training in the psychological methods and in the handling of instruments of precision as will be adequate preparation for research problems. The students will make experimental determinations of the stimulus limens, will attempt verifications of Weber's Law in various departments of sense, and will perform at least one experiment by each one of the chief psychophysical methods. Quantitative experiments in special fields may be undertaken in so far as time permits. The textbook is Titchener's *Experimental Psychology*, vol. ii, Quantitative Student's Manual.

Laboratory partnerships must be formed if the work of this course is to be pursued with profit. If, therefore, a partner cannot be found, the student is recommended to register in course S 7.

S 6. TECHNIQUE OF THE LABORATORY. Hours (three) to be arranged. *Psychological Laboratory, Morrill Hall.* Dr. BISHOP.

This course will discuss the equipment of a psychological laboratory, in the various fields of investigation and at various levels of expense. Demonstrations, with special emphasis upon principles of construction, will be given of standard pieces of apparatus contained in the Cornell University laboratories.

S 7. EXPERIMENTAL PROBLEMS. Hours and credit to be arranged. *Psychological Laboratory, Morrill Hall.* Assistant Professor DALLENBACH, Assistant Professor HOISINGTON, and Dr. BISHOP.

Courses S 1, S 4, and S 5, or their equivalents, are prerequisites for this course. The work will consist of the original study of certain experimental problems, and will involve both observation and manipulation of instruments. Completed investigations may be published in *The American Journal of Psychology*.

S 8. BRENTANO'S PSYCHOLOGY: ADVANCED COURSE. Daily except Sat., 11. GS C. Professor TITCHENER.

This course presupposes S 1 and S 4 or their equivalents. Brentano's *Psychologie vom empirischen Standpunkte* will be read by the class, and the author's influence upon modern psychology will be discussed and illustrated.

Those who intend to take the course should, if possible, bring a copy of the *Psychologie* with them.

PUBLIC SPEAKING: ORAL ENGLISH

All courses are planned to meet the special needs of high-school teachers. Individual instruction will be given by appointment without additional charge.

S 1. PUBLIC SPEAKING. Credit two hours. Daily except Sat. Two sections. Dr. CAPLAN, at 11, GS 21. Mr. THOMAS at 8, GS 21.

A practical training for speaking in public. Methods of preparation and standards of delivery; drill in the delivery of extemporaneous and prepared original speeches, and of declamations; subject matter of speeches drawn largely from required readings. High-school teachers will find the methods applicable to their work in public speaking and in oral English. Regular students passing this course are admitted to second term of Public Speaking 1.

S 1b. ARGUMENT AND DEBATE. Credit two hours. Daily except Sat., 9 GS 21. Dr. CAPLAN.

A study of the principles of conviction and persuasion, with training in analysis, in brief-drawing, and in rhetorical presentation. Emphasis on adaptation of argumentative material to the audience. Practice in speaking and debating, with drill in delivery. This course presupposes Public Speaking 1a or S1, and will be considered equivalent to the second term of Public Speaking 1.

S 3. THE TEACHING OF ORAL ENGLISH AND PUBLIC SPEAKING. Credit two hours. Daily except Sat., 11. GS 26. Assistant Professor HUNT.

Lectures, readings, reports, and discussions. A critical survey of standards, problems, and methods in oral English, public speaking, and speech training. Students in S 3 should take S 1 unless they offer a satisfactory equivalent. Creditable toward teacher's certificate.

S 8. VOICE TRAINING. Credit one hour. Daily except Sat., 10. Two sections, GS 21 and 26. Assistant Professor MUCHMORE and Mr. THOMAS.

A fundamental course for teachers of speech-training and public speaking. Exercises for the development of pure tone, flexibility, melody and strength of voice, clear enunciation, and for relief from high, strained tones, harshness, throatiness, and speakers' sorethroat; training for poise and ease of action. If needed, special exercises will be prescribed.

S 8a. PRINCIPLES OF ADVANCED VOICE TRAINING AND SPEECH CORRECTION. Credit one hour. Prerequisite S 8, or its approved equivalent, and the consent of instructor. M W F, hour to be arranged. Assistant Professor MUCHMORE.

Readings in the science underlying voice-training and speech-correction, and discussions of theories and methods. For those having sufficient background to do somewhat independent work.

S 9. TEACHERS' COURSE IN VOICE-TRAINING AND ORAL READING. Credit two hours. Daily except Sat., 12. GS 26. Consent of instructor required. Assistant Professor MUCHMORE.

Principles and methods in voice-training, phonetics, speech improvement, and oral reading. Both elementary and secondary school problems will be considered. Lectures, readings, discussions, and exercises. Students in S 9 should take S 8 or offer its equivalent.

S 10. ORAL READING. Credit two hours. Daily except Sat., 12. GS 21. Assistant Professor HUNT.

The first part of the course will be devoted to the elements of reading: attention, individualization, and sequence of ideas; the second part to the oral interpretation of literature, with special emphasis on the spirit rather than on the form. Individual drill, and preparation of at least one long selection. Regular students who pass this course will be admitted to the second term of Oral Reading, Course 10.

S 19. PLAYS AND PAGEANTRY. Assistant Professor HUDSON. See the Announcement of the College of Agriculture.

S 20. SEMINARY. For graduates. Hours to be arranged. Conducted by members of the staff. Consult Assistant Professor MUCHMORE.

For graduate students who have chosen Public Speaking as major or minor in candidacy for an advanced degree.

S 30. THE PRODUCTION OF SCHOOL PLAYS. Credit two hours. Daily except Sat., 9. GS 26. Consent of instructor necessary for admission. Mr. HULTZEN and Mr. HERRICK.

Theory of stage direction; choice of plays; elements of training; staging of plays; other practical phases of production; special emphasis on oral interpretation; one act plays rehearsed. Students in S 30 should also take S 10 or S 8.

THE SUMMER THEATRE. Director, Professor DRUMMOND, assisted by Mr. HULTZEN and Mr. HERRICK. Several plays will be given in the Campus Theatre during the Summer Session. Opportunities to assist in the productions are offered to qualified members of the class in course S 30.

ROMANCE LANGUAGES

FRENCH

S 1. ELEMENTARY COURSE. Credit four hours. Daily except Sat., 8 and 12. GS 290. Mr. CHAMPOMIER.

Entrance credit, one unit.

The object of this course is twofold: first, to give beginners a thorough drill in the essentials of French pronunciation, grammar, and reading; second, to offer to teachers an opportunity of studying the methods of presentation of these subjects to beginners.

S 2. INTERMEDIATE COURSE. Credit four hours. Daily except Sat., 8 and 12. GS 283. Mr. PELMONT.

Entrance credit, one unit. Prerequisite course S 1 or its equivalent.

S 3. ADVANCED COURSE. Credit four hours. Daily except Sat., 8 and 12. GS 227. Professors MASON and PUMPELLY.

Entrance credit, one unit. Prerequisite S 2 or its equivalent.

S 4. ADVANCED TRANSLATION. Credit two hours. Daily except Sat., 9. GS 290. Prerequisite course S 3 or its equivalent. Mr. PELMONT.

S 5. ELEMENTARY COMPOSITION AND CONVERSATION. Credit two hours. Daily except Sat., 11. GS 290. Prerequisite course S 3 or its equivalent. Mr. CHAMPOMIER.

S 9. ADVANCED COMPOSITION AND CONVERSATION. Credit two hours. Daily except Sat., 9. GS 283. Professor GUERLAC.

Rapid translation from standard English texts into French; frequent theme-writing; short talks by the student on history and literature; conversation exclusively in French.

[S 21. CONTEMPORARY FRENCH POETRY. Credit two hours. Daily except Sat., 11. Professor MASON.] Not given in 1924.

Lectures and discussions of special topics in contemporary poetry with extensive outside reading and reports.

S 23. INTRODUCTION TO FRENCH PHILOLOGY. Credit two hours. Daily except Sat., 11. GS 283. Professor PUMPELLY. Special emphasis will be put upon the importance of a knowledge of philology for teachers.

S 29. FRENCH COMPOSITION FOR TEACHERS. Credit two hours. Daily except Sat., 10. GS 283. Professor MASON.

A discussion of the teaching of composition in secondary schools. Several well-known books of composition will be studied critically.

[S 30. THE TEACHING OF FRENCH. Credit two hours. Daily except Sat., 10. GS 230.] Not given in 1924.

A detailed discussion of the more modern methods of teaching French. Lectures, assigned reading, and observation.

[S 31. PHONETICS. Credit two hours. Daily except Sat., 9. Professor MASON.] Not given in 1924.

Lectures on the basic phonetic laws of French and English and the teaching of transcription and in the reading of French. This course is especially for teachers of French but is open to all students who wish to study the pronunciation of French and English.

S 34. THE MODERN DRAMA. Credit two hours. Daily except Sat., 11. GS 227. Professor GUERLAC.

Lectures in French on the dramatic movement from 1850 to our day. Some of the most important plays will be read in the class.

[S 35. FRANCE OF TODAY. Credit two hours. Daily except Sat., 12. GS 264. Professor GUERLAC.] Not given in 1924.

Lectures in French on the social, intellectual, and political life of the present.

S 47. FRENCH SEMINARY. M W F, 9. *French Seminary Room, Library*. Professor MASON.

Discussion of special topics in the field of modern French literature. This course is especially for graduate students and candidates for the degree of Master of Arts.

FRENCH READINGS. A series of readings in French will be given by Mademoiselle COURTOIS daily except Saturday at 2.15 p. m. in the Drawing Room of Sill Cottage.

FRENCH LECTURES. A series of lectures in French dealing with French national life will be given by the members of the instructing staff in French on Wednesday evenings at 8 o'clock in *Goldwin Smith Hall*, Room 290.

LA MAISON FRANÇAISE. The Sill Cottage, situated on the Campus, is reserved for students of French. Mademoiselle Courtois is in charge and only French is spoken in the Cottage. Reservations should be made before June 1. In the dining room of Sage College, special tables where only French is spoken, are reserved for students of French. Students of French will find abundant opportunity for speaking French at the frequent social meetings held under the direction of Mademoiselle COURTOIS.

SPANISH

S 1. ELEMENTARY COURSE. Credit four hours. Daily except Sat., 8 and 12. GS 277. Mr. DOYLE.

Entrance credit, one unit.

S 2. INTERMEDIATE COURSE. Credit four hours. Daily except Sat., 8 and 12. GS 281. Mr. SHERWELL.

Entrance credit, one unit.

S 3. ADVANCED COURSE. Credit four hours. Daily except Sat., 8 and 12. GS 124. Mr. HERNANDEZ.

Entrance credit, one unit.

S 4. ADVANCED TRANSLATION. Credit two hours. Daily except Sat., 9. GS 277. Mr. DOYLE.

S 5. ELEMENTARY COMPOSITION AND CONVERSATION. Credit two hours. Daily except Sat., 11. GS 281. Mr. SHERWELL.

S 7. ADVANCED COMPOSITION AND CONVERSATION. Credit two hours. Daily except Sat., 11. GS 277. Mr. HERNANDEZ.

Special attention will be given to free composition and correspondence. The course is conducted in Spanish.

S 16. THE DRAMA OF THE GOLDEN AGE. Credit two hours. Daily except Sat., 8. GS 128. Associate Professor DALE.

Lectures, outside reading, reports, and discussions. For advanced students and graduates.

S 19. NINETEENTH CENTURY NOVELS. Credit two hours. Daily except Sat., 9. GS 281. Associate Professor DALE.

Lectures, translation, and discussion of representative works.

S 30. THE TEACHING OF SPANISH. Credit two hours. Daily except Sat., 10. GS 281. Associate Professor DALE.

A course for the discussion of materials and methods in the presentation of Spanish in the secondary schools. Special attention will be given to phonetics, classroom methods, the choice and use of texts, and auxiliary materials.

SPANISH LECTURES AND READINGS. A series of lectures and readings in Spanish by members of the instructing staff will be given during the session.

SUMMER SESSION OF THE COLLEGE OF LAW

The summer session of the College of Law will begin on Monday, June 23, and end on Friday, September 5, 1924. The session will be divided into two terms of five and one-half weeks each. The second term will begin on Thursday, July 31.

FACULTY

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D., President of the University.
CHARLES KELLOGG BURDICK, A.B., LL.B., Acting Dean of the College.
HORACE EUGENE WHITESIDE, A.B., LL.B., Secretary of the College.

HENRY WINTHROP BALLANTINE, A.B., LL.B., Professor of Law in the University of Minnesota Law School.

ARMISTEAD MASON DOBIE, B.A., M.A., LL.B., S.J.D., Professor of Law in the University of Virginia Department of Law.

OLIVER LEROY McCASKILL, Ph.B., J.D., Professor of Procedure in the Cornell University College of Law.

AUSTIN WAKEMAN SCOTT, A.B., LL.B., Story Professor of Law in the Harvard Law School.

ROBERT SPROULE STEVENS, A.B., LL.B., Professor of Law in the Cornell University College of Law.

WILLIAM REYNOLDS VANCE, B.A., M.A., Ph.D., LL.B., Litt.D., Professor of Law in the Yale University School of Law.

HORACE EUGENE WHITESIDE, A.B., LL.B., Lecturer in the Cornell University College of Law.

EDWARD ECKER WILLEVER, LL.B., Librarian.

ADMISSION

1. REGULAR FIRST-YEAR STUDENTS. All applicants for admission to the summer session as candidates for the degree of LL.B. at Cornell are required to present a certificate or diploma showing that they have successfully completed two or more years of study, other than professional law study, in a university or college of approved standing, and have received an honorable dismissal.

2. STUDENTS FROM OTHER LAW SCHOOLS. Students in good standing in other law schools will be admitted to the summer session. Such students may not become candidates for the degree of LL.B. at Cornell without complying with the entrance requirements for regular first-year students.

3. Students not falling within the above classes will be admitted to the summer session as special students, in the discretion of the faculty.

PURPOSES OF THE SUMMER SESSION

Students may enter the College of Law at the beginning of the Summer Session as well as in September. By entering in June, 1924, and attending three summer sessions and two regular college years, a student may be graduated in September, 1926. Students may also use the summer session as an experimental period, in which to determine whether they wish further to pursue the study of law. Students already engaged in the study of law may take advantage of the summer session for the purpose of making up deficiencies, or of obtaining advance credits, and of pursuing courses which they could not otherwise take.

LIBRARY AND OTHER FACILITIES

The Cornell Law Library is composed of about 56,000 volumes, and thoroughly covers the fields of British and American law. Boardman Hall, the home of the Law School, is a stone building which is unusually cool and comfortable during the summer months.

TUITION

The tuition charge is \$65 for the whole session of eleven weeks, or \$35 for either term of five and one-half weeks.

COURSES OF INSTRUCTION

CONTRACT. PROFESSOR BALLANTINE. Corbin's *Cases on Contract*. Eight hours a week, both terms. Credit six hours.

PROPERTY Ia. MR. WHITESIDE. Bigelow's *Cases on Personal Property*. Six hours a week, first term. Credit two hours.

AGENCY. MR. WHITESIDE. Hufcut's *Cases on Agency* (2nd ed.). Six hours a week, second term. Credit two hours.

WILLS AND PROBATE LAW. PROFESSOR VANCE. Costigan's *Cases on Wills*. Six hours a week, first term. Credit two hours.

INSURANCE. PROFESSOR VANCE. Vance's *Cases on Insurance*. Six hours a week, first term. Credit two hours.

PRACTICE. PROFESSOR McCASKILL. Selected Cases. Eight hours a week, first term. Credit three hours.

PARTNERSHIP. PROFESSOR STEVENS. Gilmore's *Cases on Partnership*. Six hours a week, first term. Credit two hours.

PRIVATE CORPORATIONS. PROFESSOR STEVENS. Warren's *Cases on Corporations* (2nd ed.). Eight hours a week, second term. Credit three hours.

TRUSTS. PROFESSOR SCOTT. Scott's *Cases on Trusts*. Eight hours a week, second term. Credit three hours.

DAMAGES. PROFESSOR DOBIE. Beale's *Cases on Damages* (2nd ed.). Six hours a week, second term. Credit two hours.

TAXATION. PROFESSOR DOBIE. Beale's *Cases on Taxation*. Six hours a week, second term. Credit two hours.

For further information, address the Secretary of the College of Law, Cornell University, Ithaca, New York.

SUMMER SCHOOL OF BIOLOGY

Under the auspices of the Summer Session of Cornell University and of the Summer School of the New York State College of Agriculture.

Students attending the School of Biology must register both in the Summer Session and in the Summer School of Agriculture, paying, however, but one tuition fee.

STAFF OF INSTRUCTION

HOWARD BERNHARDT ADELMANN, A.M., Instructor in Histology and Embryology.
JAMES CHESTER BRADLEY, Ph.D., Professor of Entomology (Taxonomy).
OTIS FREEMAN CURTIS, Ph.D., Professor of Botany (Physiology).
ARTHUR JOHNSON EAMES, Ph.D., Professor of Botany.
HARRY MORTON FITZPATRICK, Ph.D., Professor of Plant Pathology Mycology).
ALLAN CAMERON FRASER, Ph.D., Assistant Professor of Plant Breeding.
WILLIAM ARTHUR HAGAN, D.V.M., Professor of Pathology and Bacteriology.
OSCAR AUGUSTUS JOHANSEN, Ph.D., Professor of Entomology.
BENJAMIN FREEMAN KINGSBURY, Ph.D., M.D., Professor of Histology and Embryology.
LOUIS MELVILLE MASSEY, Ph.D., Professor of Plant Pathology.
ROBERT MATHESON, Ph.D., Professor of Entomology.
JAMES GEORGE NEEDHAM, Ph.D., Litt.D., Professor of Entomology and Limnology.
HUGH DANIEL REED, Ph.D., Professor of Zoology.
LESTER WAYLAND SHARP, Ph.D., Professor of Botany (Cytology).
SUTHERLAND SIMPSON, M.D., D.Sc., F.R.S.E., Professor of Physiology.
KARL MCKAY WIEGAND, Ph.D., Professor of Botany (Taxonomy).
CARL LOUIS WILSON, Ph.D., Instructor in Botany.
ALBERT HAZEN WRIGHT, Ph.D., Assistant Professor of Zoology.
BENJAMIN PERCY YOUNG, Ph.D., Assistant Professor of Zoology.

GENERAL PLANS AND AIMS

The Summer School of Biology was organized to provide instruction of the highest grade in zoology, botany, and allied subjects. All the regular facilities of the University are at the disposal of the student, and as far as possible the staff has been restricted to teachers of professorial rank in the University. The courses offered are for the most part those given during the regular academic year condensed into a period of six weeks, but not abridged. The work is particularly planned to meet the needs of teachers and graduate students who wish to know, in addition to the subject matter, something of the methods and sources in teaching; but undergraduates also, if sufficiently prepared, will find the courses adapted to their needs. Intensive rather than extensive work is necessarily expected of each student, as the courses are comprehensive. These courses lead toward advanced degrees, and special attention is given to graduate students pursuing research. Students interested in graduate study should, if possible, consult by letter with Professor Wiegand, or the professor concerned, before coming to Ithaca.

The intensive interest in Biology at Cornell University over a period of years has resulted in a wealth of laboratory material. Very extensive and in some cases unique collections of both plants and

animals, and a very complete working library, are available to students prepared to make use of them. Ithaca is located in the Finger Lakes region of Central New York, noted not only for its picturesque beauty, but for its richness in biological material of both plants and animals. In this respect the advantages of the University are perhaps not excelled by any other institution in the country. The collecting grounds are for the most part adjacent to the campus, and can be very readily reached. Within easy reach of the laboratories are freshwater marshes and lakes, salt springs, marl springs, marl bogs, peat bogs, extensive ravines with numerous waterfalls, and upland woods or fields overlying either calcareous or noncalcareous sandy or heavy soils. The country shows a considerable variation in elevation, thus giving samples of several life zones. It is therefore possible to use as illustrative material those inland organisms which may be obtained most readily by teachers throughout the country for use in their own classes.

[A limited amount of change in the hours scheduled may be made by the staff at the beginning of the session to avoid conflicts. In the case of morning laboratories the student may obtain permission, at the option of the instructor, to be absent for a period to attend a lecture in some other course. The time so lost is to be made up later.]

COURSES DEALING PRIMARILY WITH PLANTS

S 1. GENERAL BOTANY. Credit six hours. Equivalent to Botany 1. Lectures, M T W Th F, 8. Laboratory, M T W Th F, 9-12, W, 2-4:30. Recitations or conferences, T Th, 2-5. *Stone*. Professor EAMES and Dr. WILSON.

This course is designed to furnish a general knowledge of the fundamental facts and principles of plant life. A careful study is made of form, structure, and reproduction of representatives from the principal groups, with a view to orient the student in the plant kingdom, and to acquaint him with the principal evolutionary tendencies exhibited. Considerable attention is given to life processes, particularly in the higher plants, and to information necessary in the prosecution of more advanced or practical work connected with plants and animals. Laboratory fee, \$5.00.

S 2. PLANT PHYSIOLOGY. Credit four hours. Equivalent to Botany 20. Prerequisite, course 1 or its equivalent, chemistry, and permission to register. Lectures, M T W Th F, 12. Laboratory, T W Th F, 9-12. *Stone*. Professor O. F. CURTIS.

This course is designed to acquaint the student with the general principles of plant growth. Topics such as water-relations, photo-synthesis, translocation, digestion, respiration, mineral nutrition, and reproduction are studied in some detail and particular emphasis is placed both in laboratory and classroom on discussions of the principles and their applications to growing plants. Laboratory fee, \$4.00; deposit, \$2.00.

S 3. TAXONOMY OF VASCULAR PLANTS. Credit four hours. Equivalent to Botany 6. Prerequisite Course 1 or its equivalent. Lectures, M T W Th, 11. Laboratory, M T W Th, 2-5. Several all-day field trips will be arranged. *Stone*. Professor WIEGAND.

A study of the kinds of seed plants and ferns; their classification into genera, families, and orders; and field work on the local flora. Emphasis will be placed on wild plants, but the more common cultivated plants will receive some attention. The course is planned to follow Course 1 and to furnish an introduction to the knowledge of field botany and to the classification of the higher plants in preparation for special work in various departments and as an aid in teaching. Instruction will be given in herbarium methods. Laboratory fee, \$4.00; deposit, \$3.00.

S 4. COMPARATIVE MORPHOLOGY OF FUNGI. Credit four hours. Equivalent to Mycology 6. Prerequisite, Course 1 or its equivalent and permission to register. Lectures, M T W Th F, 9. *Bailey, West Basement*. Laboratory, fifteen actual hours a week, by arrangement. *Bailey, East Basement*. Professor FITZPATRICK.

An elementary synoptical course designed to acquaint the student with the general field of mycology. Emphasis is placed on morphology and phylogeny, rather than on taxonomy, but abundant opportunity is given for field work. Laboratory fee, \$6.00; deposit, \$3.00.

S 10. GENERAL PLANT PATHOLOGY. Credit four hours. Equivalent to Plant Pathology 1. Prerequisite, Course 1 or its equivalent and permission to register. Lectures, M W F, 7 a. m. Laboratory work; the completion of a minimum of twenty exercises requiring not less than twenty actual hours a week, with personal conference of half an hour on each. Conferences by arrangement. Laboratory at the student's convenience. Professor MASSEY.

A fundamental course treating of the nature, cause, and control of plant diseases illustrated by studies of the commoner diseases of cultivated crops. Admission limited to twenty students. Laboratory fee, \$4.50; deposit, \$3.00.

S 19. SPECIAL PROBLEMS WITH PLANTS. Credit two or more hours. Hours to be arranged.

Students who are sufficiently prepared may arrange to engage in the study of some problem or special topic. Such work may lie in the fields of general or taxonomic botany, mycology, cytology, plant physiology, or plant pathology. A certain member of the staff must supervise the work.

COURSES DEALING PRIMARILY WITH ANIMALS

S 20. GENERAL ZOOLOGY. Credit six hours. Equivalent to Zoology 1. Lectures, M T W Th F, 9. Laboratory, M T W Th F, 2-5. Field studies at hours to be arranged. *McGraw*. Professor REED and Assistant Professor YOUNG.

A comprehensive view of the subject, including the fundamentals of animal biology; the principles of structure, function, origin, and perfection of animal life; and a consideration of generalizations in zoological theory which seem to be the best founded. The study of animals in their relation as living things will be emphasized. Animal types and their classification are employed only as a service base from which study may proceed. Laboratory fee, \$5.00.

S 21. SYSTEMATIC VERTEBRATE ZOOLOGY AND ECOLOGY. Credit four hours. Lectures, Th F, 9 and 12. *McGraw* 7. Laboratory and field work, Th F, 9-12, 2-5, W, 9-1. Some all-day trips are required. Occasionally a field trip 5:30-8 a. m. or 5-8 p. m. may be substituted for the regular periods. Assistant Professor WRIGHT. Lectures on fishes, amphibians, reptiles, birds, and mammals: their habits, life-histories, coloration, respiration, locomotion, reproduction, and adaptations; together with their classification, nomenclature, characters, and relationships. Laboratory study of the parts employed in the classification of these groups, with training in the identification of two hundred and forty North American species. Field work is partially to give practice in field observation and in ready identification of local vertebrates in their natural environment, and partially to introduce some ecological methods. Textbook, Pratt's *Manual of Vertebrates of the United States*. Laboratory fee, \$3.00.

S 27. EMBRYOLOGY OF VERTEBRATES. Mornings; hours to be arranged. *Histology Laboratory, Stimson Hall*. Professor KINGSBURY and Mr. ADELMANN. Laboratory work with individual conferences and demonstrations is offered. The work will consist mainly in a study of the development of the chick and pig. Upon application provision will be made also for advanced students and teachers desiring to do special individual work in embryology or in embryological technique. A laboratory fee will cover necessary expenses.

S 28. HUMAN PHYSIOLOGY. *The functions of the human body*. Credit four hours. A knowledge of general biology is desirable. Lectures, daily except Sat., 10. Experimental work, M T Th F, 2-5. *Stimson*. Professor SIMPSON.

The functions of the animal body will be studied systematically in the lectures and illustrated by diagrams and demonstrations, while in the laboratory the stu-

dent will be required to carry out selected experiments on which the fundamental principles of the science are based. The laboratories in Stimson Hall are equipped with the most recent recording physiological apparatus, all of which the student will have the opportunity of using under direction. Laboratory fee, \$6.

S 30. GENERAL ENTOMOLOGY. Credit three hours. Equivalent to Entomology 3. Prerequisite Biology 1 or Zoology 1 or its equivalent. Lectures, M T W Th F, 10. Practical exercises, T Th, 2-5; S, 8-11. *Roberts* 392. Professor MATHESON.

This course includes lectures and demonstrations on the characteristics of the orders and families of insects, with a study of their habits, life-histories, and relations to other animals and to plants. The laboratory work consists of the study of the structure, ecology, metamorphosis, and classification of insects. Field trips to study insects in their natural habitats are an important feature. Each student is required to collect and prepare a typical collection of insects. Opportunities are given for the rearing of insects in our Insectary, and special work is offered to suit the needs of individual students. Textbook: *Comstock's Manual for the Study of Insects*. Equipment: a good hand lens, several insect cases, insect pins, and labels. These can all be purchased at Ithaca. Laboratory fee, \$2.50.

S 31. ELEMENTARY MORPHOLOGY OF INSECTS. Credit three hours. Equivalent to Entomology 4. Twenty-two actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

This course deals with the external and internal anatomy of several representative insects as the locust, roach, cicada, honeybee, crane-fly, etc. Laboratory fee, \$2.00.

S 32. ELEMENTARY SYSTEMATIC ENTOMOLOGY. Credit two hours. Equivalent to Entomology 5. Prerequisite Course 4 (S 31). Fifteen actual hours a week, by appointment. *Roberts* 391. Professor BRADLEY.

The principles of wing venation and the classification of the orders and families. Laboratory fee, \$2.00.

Courses S 31 and S 32 are required of all students who plan to take advanced work in Entomology.

S 33a. FIELD ENTOMOLOGY. Credit one hour. Field work. Prerequisite, Course S 30, or S 31 and S 32, or equivalent. M W, 2-6. *Roberts* 301. Professor BRADLEY.

The methods of collecting and preserving insects and a systematic exploration of various types of environment, with a view to making as exhaustive a survey as time permits of selected representative insect groups, the ethology of selected insects, and their breeding under control. Laboratory fee, \$3.00. Other expenses are the cost of transportation in connection with the excursions and the cost of equipment and supplies.

This course is designed to be taken in connection with S 33b.

S 33b. ADVANCED SYSTEMATIC ENTOMOLOGY AND ENTOMOTAXY. Credit two hours. Open only to students who are taking Course S 33a. M W F, 8-12; S, 8-1. *Roberts* 301. Professor BRADLEY.

Taxonomy of selected groups of insects, using as laboratory material the specimens collected in course S 33a; matters of museum technique. Laboratory fee, \$3.00.

S 34. ADVANCED MORPHOLOGY OF INSECTS. Credit two hours. Equivalent to the first term of Entomology 20. Prerequisite Course S 31, and either S 30 or S 32. Lectures, assigned reading, and reports. Daily except Sat., 9. *Roberts* 392. Professor JOHANNSEN.

This course deals with the anatomy, physiology, and microscopic structure of insects.

S 35. GENERAL LIMNOLOGY. Credit three hours. Open to students who have taken courses in general biology or in botany and zoology. Lectures, M T W, 8. *Roberts* 392. Laboratory, M T W, 2-4:30, and one period by appointment. *Roberts* 302. Professor NEEDHAM.

An introduction to the study of the life of inland waters. Aquatic organisms in their qualitative, quantitative, seasonal, and ecological relations. The course includes one week-end trip to Lake Ontario. Laboratory fee, \$3.00.

[ANIMAL ECOLOGY. It is proposed that General Limnology and Animal Ecology shall be given in alternate years. The latter course will be given in 1925.]

S 39. SPECIAL PROBLEMS WITH ANIMALS. Credit two hours or more. Hours to be arranged.

Students who are sufficiently prepared may arrange to engage in the special study of some problem or special topic. Such work may lie in the fields of general zoology, ornithology, histology, embryology, human physiology, general entomology, systematic entomology, economic entomology, limnology, or general biology. A certain member of the staff must supervise the work.

GENERAL COURSES DEALING WITH BOTH PLANTS AND ANIMALS

S 40. GENETICS. Credit four hours. Prerequisite, elementary botany and plant physiology, or elementary zoology and animal physiology, and permission to register. Courses in cytology and in taxonomic botany and zoology will be found helpful. Lectures, M T W Th F, 8. Laboratory, M W F, 2-4:30. Conferences to be arranged. *Fernow*. Assistant Professor FRASER.

A general introductory course designed to acquaint the student with the fundamental principles of heredity and variation. Special attention is given to the Mendelian interpretations of the facts of inheritance. Among the topics to be discussed are: the physical basis of heredity; simple cases of Mendelian inheritance; factor interaction; the determination of sex; factor linkage; measurement of variation; quantitative inheritance; pure lines; inbreeding and cross-breeding; cytoplasmic inheritance; and mutation, with suggestions as to the relation of genetical principles to eugenics. Laboratory studies of variation and of the laws of heredity as illustrated by hybrid material in plants and by breeding experiments with the fruit fly, *Drosophila*. Laboratory fee, \$3.

S 41. CYTOLOGY. Credit four hours. Prerequisite course S 1 (Botany 1) or S 20 (Zoology 1) and permission to register. Laboratory, M T W Th F, 9-12:30. A conference hour will be arranged during these periods. *Stone*. Professor SHARP.

This course deals with the subject matter, literature, and problems of cytology. The survey of the field is sufficiently inclusive to make the course of value to advanced students in the various branches of biology, while emphasis on certain features gives it special significance for the geneticist. The conference hours are devoted to discussions of topics suggested by the laboratory observations, and during the latter part of the term, to the review of new literature. Laboratory fee, \$5.

[HISTOLOGY OF PLANTS. It is proposed that the course in Cytology and that in Plant Histology shall be given in alternate years. Plant Histology will therefore be given in 1925.]

S 42. GENERAL BACTERIOLOGY. Credit four hours. Prerequisite some work in microscopy. Lectures, T W Th F, 9. Laboratory, T W Th F, 10-1. *Veterinary College*. Professor HAGAN.

A general introductory course in bacteriology covering the distribution, morphology, biology, and methods of study of micro-organisms. The latter half of this course is concerned with the bacteriology of water, sewage, milk and milk products, the fermentation industries, and of some of the more important human and animal diseases. The laboratory work is closely correlated with the subject matter of the lectures. After a number of sessions devoted to the development of technique, there follows work on the bacteria of air, water, milk, fermentation processes, and of disease. Laboratory fee, \$10.

SUMMER SCHOOL OF AGRICULTURE

IN THE NEW YORK STATE COLLEGE OF AGRICULTURE

OFFICERS

LIVINGSTON FARRAND, A.M., M.D., L.H.D., LL.D., President of the University.
 ALBERT RUSSELL MANN, B.S.A., A.M., Dean of the College of Agriculture,
 Director of the Experiment Station, and Director of Extension.
 GEORGE ALAN WORKS, Ph.B., M.S.A., Professor of Rural Education, in charge
 of the Summer School.
 ROBERT PELTON SIBLEY, M.A., L.H.D., Professor and Secretary.

Staff of Instruction

ARTHUR AUGUSTUS ALLEN, A.M., Ph.D.....Ornithology
 (Assistant Professor of Ornithology)
 ELSA GUERDRUM ALLEN, A.B.....Ornithology
 (Assistant in Ornithology)
 THOMAS LEVINGTON BAYNE, jr., M.S.....Rural Education
 (Instructor in Rural Education)
 CHARLES BEAMAN, B.S.....Nature Study
 (High School Department and Science, State Normal School, Brockport, N. Y.)
 FREDERICK GARDNER BEHREND, B.S.....Rural Engineering
 (Assistant Professor of Rural Engineering)
 HAROLD EUGENE BOTSFORD, B.S.....Poultry
 (Assistant Extension Professor of Poultry Husbandry)
 FRANCES ARTIE BROOKINS.....Home Economics
 (Instructor and Assistant Director of Costume Shop)
 ERNEST BURNHAM, Ph.D.....Rural Education
 (Director of Rural Education, Western State Normal School, Kalamazoo, Mich.)
 JULIAN EDWARD BUTTERWORTH, Ph.D.....Rural Education
 (Professor of Rural Education)
 JOHN L. BUYS, B.S., Ph.D.....Nature Study
 (Science Department, St. Lawrence University, Canton, N.Y.)
 THOMAS NIXON CARVER, Ph.D. . .Agricultural Economics and Farm Management
 (Professor of Economics, Harvard University)
 PETER WALTER CLAASSEN, Ph.D.....Biology
 (Assistant Professor of Biology)
 ANNA BOTSFORD COMSTOCK, B.S.....Nature Study
 (Emeritus Professor of Nature Study)
 EMMA CONLEY.....Rural Education
 (Supervisor of Homemaking Education, N. Y. State Department of Education)
 RAYMOND BRIDGMAN COWLES, B.A.....Biology
 (Instructor in Biology)
 RALPH WRIGHT CURTIS M.S.A....Floriculture and Ornamental Horticulture
 (Professor of Ornamental Horticulture)
 THEODORE HILDRETH EATON, Ph.D.....Rural Education
 (Professor of Rural Education)
 RALPH ALMOND FELTON, M.A.....Rural Social Organization
 (Extension Professor of Rural Social Organization)
 EMERY N. FERRISS, Ph.D.....Rural Education
 (Professor of Rural Education)
 A. LEAH GAUSE, B. S.....Nature Study
 (Nature Study, State Normal School, Fredericksburg, Va.)
 GEORGE R. GREEN, M.F.....Nature Study
 (Professor of Wood Utilization and Nature Study, Pennsylvania State College)

C. A. GREGORY, Ph.D.	Rural Education
(School of Education, University of Oregon)	
FLORENCE M. HALE	Rural Education
(State Supervisor of Rural Schools, State Department of Maine).	
EDWIN RAY HOSKINS, B.S.	Rural Education
(Instructor in Rural Education)	
RALPH SHELDON HOSMER, B.S.A., M.F.	Forestry
(Professor of Forestry)	
HOYT HOPEWELL HUDSON, Ph.D.	Rural Social Organization
(Instructor in Public Speaking)	
CHARLES EDWARD HUNN	Floriculture and Ornamental Horticulture
(Instructor in Ornamental Horticulture)	
FRANCES BEATRICE HUNTER, B.S.	Home Economics
(Assistant Professor of Home Economics)	
OSKAR AUGUSTUS JOHANNSEN, Ph.D.	Entomology
(Professor of Entomology)	
PAUL J. KRUSE, Ph.D.	Rural Education
(Professor of Rural Education)	
CARL EDWIN LADD, Ph.D.	Agricultural Economics and Farm Management
(Extension Professor of Farm Management)	
CAROLYN BRUNDAGE MCILROY	Home Economics
(Instructor in Home Economics and Shop Director)	
ROBERT MATHESON, Ph.D.	Entomology
(Assistant Professor of Economic Entomology)	
BRUCE LEE MELVIN, Ph.D.	Rural Social Organization
(Acting Professor of Rural Social Organization)	
LUA ALICE MINNS, M.S.	Floriculture and Ornamental Horticulture
(Instructor in Floriculture)	
HELEN MONSCH, B.S., M.A.	Home Economics
(Professor of Home Economics)	
CLYDE B. MOORE	Rural Education
(Professor of Education, University of Pittsburgh)	
RICHARD ALAN MORDOFF, Ph.D.	Meteorology
(Assistant Professor of Meteorology)	
AMY T. MORSE	Home Economics
(Professor of Home Economics, University of Minnesota)	
WALTER CONRAD MUENSCHER, Ph.D.	Botany
(Assistant Professor of Botany)	
WILLIAM IRVING MYERS, Ph.D.	Agricultural Economics and Farm Management
(Professor of Farm Management)	
FRANK ASHMORE PEARSON, Ph.D.	Agricultural Economics and Farm Management
(Professor of Agricultural Economics)	
NELLIE PERKINS, Ph.D.	Home Economics
(Director Wayne County, Michigan, Psychopathic Clinic)	
MILES D. PIRNIE, B.S.	Ornithology
(Assistant in Ornithology)	
JOSEPH PULLMAN PORTER, M.S.A., M.L.D.	Floriculture and Horticulture
(Assistant Extension Professor of Ornamental Horticulture)	
REENA ROBERTS, B.S., M.A.	Home Economics
(Assistant Professor of Home Economics)	
LOUIS MICHAEL ROEHL, B.S.	Rural Engineering
(Assistant Professor of Rural Engineering)	
HENRY WILLIAM SCHNECK, M.S.A.	Vegetable Gardening
(Assistant Professor of Vegetable Gardening)	

WILLIAM L. SPENCER, B.A., M.A.....	Rural Education (High School Inspector, State Department, Alabama)
ROLLAND MACLAREN STEWART, Ph.D.....	Rural Education (Professor of Rural Education)
GEORGE ALAN WORKS, Ph.B., M.S.A.....	Rural Education (Professor of Rural Education)
FRANCES ZUILL, B.S., M.A.....	Rural Education (Supervisor Home Economics Education, Department of Education, Baltimore, Maryland)

COURSES IN THE COLLEGE OF AGRICULTURE

The New York State College of Agriculture provides courses of instruction under the rules and regulations that follow:

1. **ADMISSION.** The Summer School in the College of Agriculture is designed to meet the needs of persons engaged in educational work, including teachers, supervisors, superintendents, extension workers, and others.

2. **TUITION AND FEES.** Tuition in any of the courses following is free to admitted students who are residents of New York and who have been residents for at least one year immediately preceding registration. An incidental fee of ten dollars is, however, charged to all students for admission. Students from outside of the State of New York, whether they take one subject or more, will pay \$40, in which is included the incidental fee. For the time and place of payment see page 12.

In certain courses laboratory fees are charged. These are indicated in connection with the courses. Fee cards must be procured from the instructor at the first exercise, and must be returned to him receipted within five days.

3. **ACADEMIC CREDIT FOR WORK.** A student who has previously satisfied the entrance requirements of the College may obtain credit for work in a Summer School up to a limit of eight hours. Residence credit will be given if six hours are passed, but not more than a total of two terms of residence may be obtained by attendance at Summer Schools.

The demand for some courses is not great enough to justify offering them every year. For this reason certain departments of the college offer instruction only in alternate years. For the requirements of the degree B.S. (eight terms, 120 hours, etc.) see the Announcement of the College of Agriculture.

SUMMER-TERM. The Summer Term of twelve weeks formerly conducted in this college has been discontinued and additional courses are now offered in the Summer School of Agriculture.

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

S 2. **FARM MANAGEMENT.** Credit three hours. Lectures, daily except Sat., 8. Laboratory, T F, 2-4:30. *Farm Management* 102. Professor MYERS.

This course is designed for advanced and graduate students. It should be preceded by economics and as many as possible of the courses dealing with the production of crops and animals.

Lectures, recitations, and laboratory practice. Farming as a business; types of farming; balance of business; size of business; rates of production; farm layout; building arrangement; labor management; machinery; marketing; ways of beginning a farm; forms of tenure and leases; choosing and buying a farm; use of capital and credit; planning, organization, and management of specific farms. Two half-day field trips and one two-day field trip will be taken. Estimated cost of trips, \$10. Laboratory fee, \$2.

S 15. METHODS AND RESULTS OF RESEARCH IN MARKETING. Credit two hours. Lectures, daily except Sat., 10. Laboratory, W, 2-4:30. *Farm Management* 102. Professor LADD.

This course is designed to acquaint the student with methods of research in marketing problems, sources of data, and results of marketing studies. The factors which enter into efficient marketing will be considered. Methods of measuring these efficiency factors and results of such studies applied to some nationally grown products will be given.

S 30. AGRICULTURAL ECONOMICS. Credit two hours. Prerequisite Economics 51 or equivalent. Lectures, daily except Sat., 11. *Farm Management* 102. Professor CARVER.

A study of the relation of rural economy to nation building, following as far as possible the problem method, beginning with the problem, How many people can the United States feed from its own soil under varying systems of production and standards of consumption? Why do people emigrate, concentrate in dense populations, or spread out in sparse populations? What effect on life and on agriculture does the outdoor work of farm life produce? What are the effects on food production of different land policies and systems of land tenure, systems of tenancy, large and small holdings, colonization, etc.? The economic and social results of different systems of agricultural labor; of different systems of distributing farm products; of different systems of farm finance; rural credit, etc.

S 39. AGRICULTURAL PRICES. Credit two hours. Lectures, M F, 10. Laboratory, M Th, 2-4:30. *East Roberts* 232. Professor PEARSON.

S 40. AGRICULTURAL PRICES. Advanced Course. Credit one hour. Lectures, W, 8. Laboratory, W, 2-4:30. *East Roberts* 232. Professor PEARSON. For advanced and graduate students who have completed S 39.

S 50. PUBLIC PROBLEMS. Credit one or two hours. Lectures, M W F, 12. *Roberts Assembly*. Discussion period, M W F, 4:30. *Farm Management* 102. Credit one hour for those who take the 12 o'clock lectures only. The discussion periods are primarily for graduate students and are more technical. Credit two hours for those who take both periods. Professors LADD and MYERS in charge.

A series of lectures intended to give a brief survey of some of the outstanding economic, social, and educational problems of agriculture. Among the speakers will be agricultural leaders of national prominence.

S 51. POPULATION AND FOOD. Credit two hours. Lectures, daily except Sat., 9. *Farm Management* 102. Professor CARVER.

This course will be conducted as a seminary. There will be few lectures but many reports of progress on investigations undertaken by the students. The general subject is population and the food supply. Any topic that bears upon this general question may be investigated by the student. Two groups of problems may be considered; first, how many people can the world or any definite portion of it feed from its own soil, under the best systems of cultivation now known, habits of consumption remaining as they now are? second, how many can it feed under various revisions of the habits of consumption?

BIOLOGY

S 1. GENERAL BIOLOGY. Credit one or three or four hours. (a) For three hours' credit, lectures and recitations, daily except Sat., 11, *Roberts* 392; laboratory and field work, M W F, 2-4:30; other sections by special appointment, *Roberts* 302. (b) For one hour credit, conferences and laboratory, T Th, 2-4:30. These two periods (a) and (b) must also be taken by those wishing four hours' credit. Assistant Professor CLAASSEN and Mr. COWLES.

The three-hour course is designed to acquaint the general student and the prospective teacher with the main ideas of biology through selected practical studies of the phenomena on which biological principles are based. Lectures, laboratory work, and field trips will deal with such topics as: interdependence of organisms as illustrated by insects and flowers, insects and galls, etc.; the simpler organisms, such as amoeba, paramoecium, flagellates, and other protozoans; and algae, fungi, bacteria, and slime molds. The study of these simpler organisms will be followed by studies of such plant types as liverworts, mosses, and ferns, and such animal types as hydra, earthworm, grasshopper, and frog.

Students completing this course (a) will be given credit for the first term's work in Biology I of the regular academic year. Laboratory fee, \$2.50.

The one-hour course (b), T Th, 2-4:30, is open only to students who are taking course (a) or who have had its equivalent. It is designed for teachers of biological sciences and will deal particularly with laboratory equipment, laboratory technique, the preparation of materials for class use, growing of cultures, preparation of models and charts, methods of collecting and preparing material for class use, etc.

Teachers desiring to take up the problem of methods of teaching biology will profit by taking Course S 63 in Rural Education.

BOTANY

S 5. TREES AND SHRUBS. Credit two hours. Lectures, Th, 2. Laboratory or field work, T, 2-5, Th, 3-5. *Stone*. Assistant Professor MUENSCHER.

A course intended for those who wish to know the woody plants in the field. The aim is to familiarize the student with as many as possible of the trees and shrubs of the Cayuga Lake flora and to teach the main facts of their structure, growth, habit, and distribution. Some all-day trips will be required. Laboratory fee, \$1.50; deposit, \$3.00.

ENTOMOLOGY

S 3. GENERAL ENTOMOLOGY. Credit three hours. Identical with S 30 in Summer School of Biology. Prerequisite Biology I, or Zoology I or its equivalent. Lectures, M T W Th F, 10. Practical exercises, T Th, 2-5 and S, 8-11. *Roberts* 392. Professor MATHESON.

This course embraces lectures and demonstrations on the characteristics of the orders and families of insects: their habits, life-histories, and relations to other animals and to plants; methods of rearing, studying, collecting, and mounting insects.

The laboratory work will consist in the study of the structure, ecology, metamorphoses, and classification of insects. Field trips to study insects in their natural habitats will be an important feature. Each student will be required to collect and prepare a typical collection of insects. Opportunity will be given for the rearing of insects in our Insectary and special work to suit the needs of students will be offered. Textbook, Comstock's *Manual for the Study of Insects*. Equipment: A good hand lens, several insect cases, insect pins, and labels. These can all be purchased at Ithaca. Laboratory fee, \$2.50.

S 4. ELEMENTARY MORPHOLOGY OF INSECTS. Credit three hours. Identical with S 31 in the Summer School of Biology. The work is individual; twenty-two actual hours a week in the laboratory at times to be arranged. In this course the external anatomy of a number of insects (locust, bee, cicada, ground beetle, etc.) is studied as well as the internal anatomy of some large representative species. *Roberts* 391. Professor JOHANNSEN. Laboratory fee, \$2.

S 5. ELEMENTARY SYSTEMATIC ENTOMOLOGY. Credit two hours. Identical with S 32 in the Summer School of Biology. The work is individual; fifteen actual hours a week at times to be arranged. Prerequisite Course 4. The aim of this course is to acquaint the students with the external structure of insects for the purpose of identification of the commoner families. *Roberts* 391. Professor JOHANNSEN. Laboratory fee, \$2.

Courses 4 and 5 are required of all students who plan to take advanced work in entomology.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

S 1. GARDEN FLOWERS. Credit one hour. Lectures, M F, 11. Laboratory, M, 2-5. *Greenhouses*. Miss MINNS.

This is designed as an elementary course of value in home flower garden or school garden work. It is outlined so as to acquaint students with the most valuable material for this work, and to cover, as time may permit, methods of propagation and culture. Laboratory fee, \$1.50.

S 2. INDOOR FLOWER GROWING. Credit one hour. Lectures, T Th, 11. Laboratory, T, 2-5. *Greenhouses*. Miss MINNS.

The propagation and culture of plants suitable for winter gardens in school-rooms, including a study of containers, soils, fertilizers, insecticides. The selection of varieties of bulbs and their methods of culture indoors are considered, as are also the method of propagation and general care of species of plants suited for indoor culture.

S 3. LANDSCAPE PLANNING. Credit two hours. Lectures, W, 9, Th, 12, F, 8-10. Practice, Th, 2-5. Should be accompanied by S 6. *Caldwell* 400. Assistant Professor PORTER.

A discussion of the fundamental principles involved in landscape planning as related to the home grounds, school grounds, and village improvement work. A brief course intended for students who desire an intelligent point of view but who do not have time for more technical courses. Laboratory fee, \$1.00.

S 4. GARDEN FLOWERS. Credit two hours. Lectures, M T Th, 9. Laboratory, W F, 2-5. *Greenhouses and Gardens*. Miss MINNS. Laboratory fee, \$2.00.

This course, planned primarily for graduate and advanced students in floriculture and ornamental horticulture, comprises a study of herbaceous plant materials. The aim is to give the student such an intimate knowledge of these forms of plants as may be used in garden planting, either on home grounds, rural social centers, or public parks, more particularly with reference to summer conditions. Students must have had sufficient botany to be familiar with the botanical characters and classification. An excellent collection of plant material is available for demonstrations. All members of the class will participate in an excursion to the Thompson Estate at Canandaigua on August 13.

S 5. WOODY PLANT MATERIALS FOR LANDSCAPE PLANTING. Credit three hours. Lectures, M T W Th, 8. Laboratory and field trip, M T W, 10-12:30; Th, 10-12; M T, 2-4:30. *Greenhouses and Campus*. Professor CURTIS and Assistant Professor PORTER. Intended for graduate students and advanced students in floriculture and ornamental horticulture. Laboratory fee, \$2.

A study of the characteristics and requirements of trees, shrubs, and vines, for landscape planting. The laboratories and field trips enable the student to recognize common woody plants. The lectures discuss planting areas and planting practices, and plant materials, in order that the student may learn to see plants not only as growing things but as possible units in planting in design with which he may be able to improve his surroundings. All members of the class must participate in an excursion to Rochester and Buffalo on August 14 and 15 to visit private estates and public parks.

S 6. LANDSCAPE PLANTING. Credit one hour. Lectures, Th, 10. Practice, S, 9-12, W, 10-1. Should be accompanied by S 3. *Caldwell* 400. *Greenhouses and Campus*. Assistant Professor PORTER.

A brief course intended to familiarize the student with the best trees, shrubs, and vines for landscape work. Names, characteristics, and requirements will be studied in the field and the laboratory. Lectures will deal with planting practices and the selection and arrangement of plants. Laboratory fee, \$1.50.

S 7. WOODY PLANT PROPAGATION AND NURSERY WORK. Credit one hour. Lectures, F, 10. Laboratory, S, 8-1. Laboratory fee, \$3. Mr. HUNN.

This course considers the methods of propagation of all classes of ornamental woody plants and their special treatment during the first stages of growth. It also acquaints the students with the principles governing the transplanting of

trees, shrubs, and herbaceous perennials and the methods practiced in all types of commercial nursery management. Must be accompanied by S 3, S 4, and S 5. *Floriculture Building and Nursery.*

FORESTRY

S 1. THE TREE AND THE FOREST. Credit one hour. T Th, 8. Field work, W, 2-4:30. *Fernow 122.* Professor HOSMER.

This course lays emphasis on simple means of identification of the principal forest trees of this region. It includes a study of the characteristics of forest trees and forest types, the life history of the forest, and other facts fundamental to the right use of forests. Some attention will be given to the identification and the commercial uses of a few of the principal kinds of woods. Field work supplements the work in the lecture room.

S 2. FORESTS AND FORESTRY. Credit two hours. Lectures, M T W F, 10. Field work, Th, 2-4:30. *Fernow 122.* Professor HOSMER.

This course will carry forward the foundation work of Forestry S 1. It presupposes a working knowledge of the native trees. The two courses, while independent, are supplementary to each other. Forestry S 1 is not prerequisite.

Topics to be considered: the nature and scope of forestry; methods employed in the perpetuation of forests; the economic importance of forests to the nation, including influence on stream flow and the relation of the forest to recreation with special application to New York State; brief description of the forest regions of the United States; present status of Federal, State, and private forestry.

As far as is possible, the lectures are followed by opportunities to make special observations in the field.

HOME ECONOMICS

S 25. CHILD-HEALTH AND NUTRITION. Credit two hours. Prerequisite a sound technical knowledge of dietetics. Conferences, daily except Sat., 9. *Home Economics 100.* Practice by arrangement to alternate with practice in S 215 a, daily except Sat., 11-1:30. *Home Economics Apartment.* Professor MONSCH.

This course is designed to meet the needs of persons having thorough technical training in nutrition who desire intensive study of the problems of child-feeding. It will include a study of the physical development, general hygiene, and feeding of children during the period of infancy as well as pre-school and school years. The best ways and means of securing better food practices among children will be considered. This will necessitate close correlation with the course in child training. Students registered for this course are therefore advised to register for part or all of S 215 a. Laboratory practice will consist of the study of the problem of feeding a group of pre-school children and the opportunity to plan, prepare, direct, and observe the midmorning and noon lunches of this group. Registration limited to twenty students. Laboratory fee, \$3.

S 215 a. CHILD TRAINING. Credit two to four hours. Prerequisite general or educational Psychology. Lectures and conferences, daily except Sat., 8. *Home Economics 245.* Practice by arrangement to alternate with laboratory practice in S 25, daily except Sat., 9-1:30. Dr. PERKINS.

This course is designed primarily for persons interested in teaching home economics who feel the need for a greater knowledge of the problems of child training. The lectures and conferences will include study of the behavior problems of children and ways of meeting them. Practice will include assistance in the problem of teaching, directing, and observing the habits of a group of pre-school children. This course will be closely correlated with the course on child-health and nutrition. Students registering for this course are advised to register also for S 25. Registration for lectures not limited. Registration for practice as well as lectures limited to twenty students. Laboratory fee, \$5.

S 130. USE OF THE PRACTICE HOUSE IN TEACHING HOME ECONOMICS. Credit four hours. Lectures, daily except Sat., 2. Practice by arrangement consists of two weeks in the practice house. Assistant Professor ROBERTS.

This course is designed to meet the needs of persons who have had technical training in home economics and experience in teaching and who desire to prepare

themselves to take charge of a practice house or to use it as a laboratory for teaching home economics in a high school or college. It will include study of the problems arising in the management and organization of a practice house and practice in meeting these problems. Registration limited to eighteen students. Laboratory fee \$20, which includes board and room for two weeks in the practice house.

S 65 a. ADVANCED CONSTRUCTIVE COSTUME DESIGN. Credit four hours. Prerequisite thorough technical training in clothing construction, clothing design, and textiles. Lectures, daily except Sat., 9. *Home Economics* 300. Practice, daily except Sat., 10-1. *Home Economics* 300. Assistant Professor HUNTER.

This course is designed to meet the needs of technically trained persons who desire to increase their knowledge of clothing design. It includes a study of the fundamental principles of design as expressed in modern costume. Students develop these principles by means of paper, materials, water color and black-board sketching, and shopping expeditions. Designing is done with flat patterns and through draping. Estimated expense, \$8. Registration limited to sixteen students.

Students desiring to register for this course must first secure permission from the department.

S 110. HOUSE DECORATION AND FURNISHING. Credit four hours. Prerequisite technical training in elementary design. Lectures, daily except Sat., 22. *Home Economics* 245. Practice, daily except Sat., 3-5:30. *Home Economics* 415. Professor MORSE.

This course is designed primarily for persons technically trained in home economics who expect to use the information in resident or extension teaching. It deals primarily with the problems of decorating and furnishing homes. Its object is to develop good judgment and taste in the selection and arrangement of house furnishings. The principles are developed through sketches, observation, and practical experience in selecting and arranging furnishings and textiles in various types of rooms. Registration limited to twenty students. Laboratory fee, \$7.50.

S 75. COMMERCIAL CLOTHING INSTRUCTION. Credit two to four hours. Prerequisite advanced work in clothing construction and design. Laboratory practice by arrangement. *Home Economics* costume shop. Mrs. McILROY and Miss BROOKINS.

This course is designed to meet the needs of persons who have had technical training in clothing and experience in teaching and who desire to increase their knowledge and skill. It considers problems of dressmaking and shop management. The students work under instructors experienced in commercial practice. Dressmaking problems in construction, fitting, finishing, designing, and in meeting customers are considered. The shop is equipped as a typical shop with a number of paid workers; hence it furnishes an opportunity to work out problems in shop organization and management. Registration limited to fourteen students.

METEOROLOGY

S 1. METEOROLOGY AND CLIMATOLOGY. Credit two hours. Lectures and discussions, daily except Sat., 10. *East Roberts* 341. Assistant Professor MORDOFF.

This course is adapted to the needs of teachers and students of subjects in which weather and climate are important factors, particularly teachers of physical geography and general agriculture. It is designed to acquaint the student with the laws governing the primary and secondary circulation of the atmosphere and with the development, progression, and conditions that attend cyclones, tornadoes, and other atmospheric phenomena. Attention is given to the principles and practice of weather forecasting from weather maps and from local observations.

S 2. METEOROLOGY AND CLIMATOLOGY, LABORATORY COURSE. Credit one hour. W F, 2-4:30, or other periods to be arranged. Must be accompanied by Course S 1. *East Roberts* 341. Assistant Professor MORDOFF.

The work consists in the study of the principal weather and climatic elements with the aid of maps, charts, and instruments. The various meteorological instruments will be studied, as well as the methods of taking and recording the observations.

NATURE STUDY

S 1. GENERAL NATURE STUDY. Credit two hours. Lectures, M W F, 10, *Fernow* 16. Field and laboratory observations, T Th, 10-12:30 or 2-4:30, *Fernow* 16. Professor COMSTOCK, Mr. BEAMAN, Dr. BUYS, Professor GREEN, and Miss GAUSE.

To acquaint teachers with the principles and methods of education through nature study and to give them practice in types of work which will permit them to carry on the work independently. As many as possible of the laboratory periods will be spent in the fields in the study of birds, trees, plants, and insects, and students expecting to take the course should keep this in mind. The program adopted by the *Cornell Rural School Leaflet* since January 1920 will be followed in lectures and the exercises will include practical methods for conducting nature study in graded and ungraded elementary schools.

S 3. NATURE LITERATURE. Credit two hours. Lectures, M W F, 12. Laboratory periods to be arranged. *Fernow* 16. Professor COMSTOCK.

Only those who have had course S 1 or its equivalent are eligible. The course includes discussions of nature study reference books, nature story writers, and nature essayists and poets.

S 63. SCIENCE IN THE RURAL SECONDARY SCHOOL. Credit two hours. Daily except Sat., 9. *Fernow* 16. Mr. BEAMAN. See Rural Education, course S 63.

ORNITHOLOGY

S 1. ORNITHOLOGY. Credit three hours. Lectures, M W F, 11. *McGraw* 5. Laboratory, M W, 2-5, or T Th, 2-5. Field work, M W, or T Th, 5:30-8 a. m. Assistant Professor ALLEN, Mrs. ALLEN, and Mr. PIRNIE.

This course gives an introduction to the study of birds and familiarity with the local species. The lectures cover such subjects as classification, migration, coloration, song, nest-building, eggs, care of young, methods of attracting birds, and economic importance. The laboratory work with bird skins gives an intimate knowledge of the birds of Eastern North America and familiarity with the use of a manual. The aim of the field work is the identification of birds by their songs, as well as by their plumage and habits. Each student should be provided with Chapman's *Handbook of Birds of Eastern North America* and with field or opera glasses. Laboratory fee, \$2.

S 2. APPLIED ORNITHOLOGY. Credit two hours. Lectures, T Th, 11. *McGraw* 5. Laboratory and field work, T Th, 2-5. Open only to those who are taking the elementary course or who have had its equivalent. Assistant Professor ALLEN.

This course is intended to meet the needs of teachers or students who plan further study of ornithology. The lectures cover the field open to prospective ornithologists, methods of teaching, preparation of specimens and lantern slides, bird photography, wild life conservation, and game farming. The laboratory and field work will give practical exercises. Laboratory fee, \$2.

POULTRY HUSBANDRY

S 1. PRINCIPLES AND PRACTICE OF POULTRY MANAGEMENT. Credit five hours. Lectures, daily 8. *Poultry* 325. Laboratory, M W F, 2-4:30. *Poultry* 300. Assistant Extension Professor BOTSFORD.

Designed primarily for teachers in agricultural high schools and other secondary agricultural schools. The course consists of thirty-six lectures and preliminary examinations, and eighteen laboratory practice periods; and includes a general discussion and practical application of the principles of incubation; brooding; rearing; feeding; illumination; breeding for constitutional vigor and egg production; sanitation and disease; marketing; housing; and general poultry farm management.

Feeding, incubating, brooding, and marketing practice three times daily by appointment, morning, noon, evening. *Poultry Auxiliary Buildings*. Practice in feeding for egg production and for fattening includes the preparation for market, record keeping, and general care and management of fowls. Practice in incubating

includes operation of incubators, disinfection, record keeping, and general management of the hatch. Brooding practice includes feeding, brooding, caring for young chicks, keeping of temperature, food, and growth records. Marketing practice includes cleaning, testing, grading, packing, and shipping eggs, and preparing poultry for market. Laboratory fee, \$5.

RURAL EDUCATION

S 2. EDUCATIONAL PSYCHOLOGY. Credit two hours. Daily except Sat. Section I, 9. *Caldwell* 143. Section II, 11. *Caldwell* 143. Section III, 8. *Caldwell* 143. The latter half of a more intensive treatment, the first half of which was given in 1923. Admission to Section III only by special permission. Professor KRUSE and Mr. BAYNE.

The original nature of man: reflexes, instincts, and capacities; individual differences; the nature of learning; progress in learning; transfer of learning; such special phases of learning as habit formation, memorizing, motor learning, and controlled thinking.

S 4. PRINCIPLES OF TEACHING. Credit two hours. Daily except Sat., Section I, 11. *Caldwell* 100. For students interested in the teaching of high school subjects. Section II, 9. *Caldwell* 100. For students interested in teaching elementary subjects. Mr. SPENCER and Miss HALE.

A consideration of the problems of teaching; how to motivate study, cultivate interest, organize teaching materials, plan class work, select and solve problems, construct and present questions, drill, measure the results of teaching, etc., to make clear the principles which are fundamental to efficient instruction.

S 6. TEACHING AGRICULTURE IN THE HIGH SCHOOL. Credit two hours; with laboratory, three hours. Daily except Sat., 9. *Caldwell* 250. Laboratory, T Th, 2-4:30. *Caldwell* 282. Designed for teachers of agricultural courses or for students preparing to teach such courses. Professor STEWART.

A study of the problems confronting the teacher of agriculture: the vocational point of view in instruction; determination of courses of study; making up the agricultural part of the curriculum; forms of teaching, including a consideration of the use of the project and the survey; the selection and utilization of textbooks, materials, and equipment; the organization of materials of instruction in agricultural courses; the relationships of the teacher to other agencies.

S 7 a. TEACHING HOME ECONOMICS IN THE ELEMENTARY AND SECONDARY SCHOOL. Credit two hours. Lectures and discussions, daily, 9. *Caldwell* 282. Miss CONLEY.

This course is particularly concerned with modern methods of education as related to home economics and is designed to assist teachers in improving their methods of teaching. Consideration will be given the following problems: selection and organization of subject matter into lesson units for elective and vocational as well as for part-time and continuation school classes; analysis of teaching steps in type units of given courses; making of lesson plans, individual instruction sheets; modern teaching methods in classroom and laboratory; methods of interesting pupils in school and home projects; methods of supervising projects; coordinating class work with homemakers' interests; coordinating home economics with related art and science.

S 7 b. HOME ECONOMICS CURRICULUM BUILDING FOR THE ELEMENTARY AND SECONDARY SCHOOL. Credit two hours. Lectures and discussions, daily except Sat., 11. *Caldwell* 294. Miss ZUILL.

This course will deal with the problems involved in the construction of home economics curricula; characteristics and inadequacies of present curricula project and other modern types of curriculum building; criteria for the selection of subject matter from the standpoint of social worth, of psychological organization; provision for individual progress of pupils; objectives of curricula in terms of habits, attitudes, knowledge, and skill; scales and tests with which to measure the results of courses; constructing curricula for elementary and secondary schools, both vocational and elective; for part-time and continuation schools.

S 8 a. TEACHING. Credit to be arranged. Opportunity will be provided for a limited number who must have credit in teaching for certification purposes. Students planning to take this course should arrange for it in advance. Professor STEWART and Mr. HOSKINS.

S 10. EDUCATIONAL MEASUREMENT. Credit two hours. Section I, daily except Sat., 8. *Caldwell* 282. For teachers and principals. Dr. GREGORY.

An introduction to tests and measurements; the general divisions of the subject; what we hope to accomplish by the use of tests; limitations of tests; tests and ordinary examinations compared and contrasted; the fundamental principles of test making; an examination of intelligence and school achievement tests now in use; treatment of elementary statistical terms and methods.

Section II, M W F, 2-4 *Caldwell* 282. For principals, supervisors, superintendents, and other administrative officers. Dr. GREGORY.

Statistical method, its meaning, use and limitations in the administration of schools; meaning of statistical terms; classification of pupils by statistical method; grading systems; how to tabulate school data. Enough of statistical method will be presented to meet the administrative needs of the school. An evaluation of school tests. Assigned readings and reports.

S 11. CONFERENCES ON STATISTICAL METHODS. Credit may be arranged. Designed primarily for students taking courses in Rural Education. Daily except Sat., 2. *Caldwell* 225. Mr. BAYNE.

By appointment, individual aid will be given to those students whose studies in the field of education require the employment of statistical methods. The conferences are scheduled for those who are working upon definite problems. In relation to such individual problems the conferences will treat of: the collection, classification, and summarization of data; the use of measures of central tendency, of variability, of relationship, and of reliability; and the use of graphic methods.

S 14. THE TRAINING OF TEACHERS OF AGRICULTURE. Credit two hours. Daily except Sat., 8. *Caldwell* 492. Professor EATON.

A course based upon the study of the work of teachers of agricultural vocations in the secondary schools. In the light of such study will be discussed the demands upon the teacher; current and ideal standards of qualification in teachers; the aims, admission requirements, course-content, methods, and administrative organization of institutions for the training of teachers of agriculture.

S 15. PROBLEMS OF TRAINING TEACHERS OF HOME ECONOMICS. Credit two hours. Daily except Sat., 10. *Caldwell* 100. Miss CONLEY.

Designed to meet the needs of persons who have had both technical preparation in home economics and experience in teaching, and who desire to prepare for the special problems involved in the professional work of preparing teachers of home economics. The course treats collegiate and secondary curricula in home economics with reference to the technical preparation of teachers, their professional needs, supervised teaching experience, and the organization and content of the special methods courses in home economics.

S 16. THE HIGH SCHOOL IN RURAL AND VILLAGE COMMUNITIES. Credit two hours. Daily except Sat., 11. *Caldwell* 282. Professor FERRISS.

A course dealing with basic problems of modern secondary education in its adaptation to rural and village conditions. Special consideration is given to the junior high school as a practicable form of secondary school organization for the rural or village community and to the problems of organization and subject matter. Other guiding topics are: the scope and functions of secondary education; present demands upon the rural and village high school; the senior high school in rural and village communities; prevocational and vocational work; educational and vocational guidance; extra-classroom activities; needed forms of extension work.

S 17. THE RURAL AND VILLAGE PRINCIPALSHIP. Credit two hours. Daily except Sat., 8. *Caldwell* 100. Professor FERRISS.

A course designed for principals and superintendents of rural and village schools having both the elementary and the high school work, and for those preparing for such positions. It deals with such practical problems as the preliminary organization of the school; schedule making and distribution of teaching load;

aims and methods of supervision; teachers' meetings; the training of teachers in service; measuring teachers' efficiency; testing, grading, and promotion of pupils; school government; direction and control of extra-classroom activities; guidance of pupils; supervision of studies; the principal and the community.

S 18. PRINCIPLES OF RURAL SCHOOL ADMINISTRATION. Credit two hours. Daily except Sat., 9. *Roberts* 292. Professor BUTTERWORTH.

The purpose of this course is to develop the principles that govern the organization and administration of education in a state, particularly with reference to the rural situation. The chief problems to be considered are: functions of local state, and intermediate units of school control; an evaluation of different types, of local and intermediate units—county, township, district, community; forms of organization for the most effective performance in each unit; federal leadership; functions of laymen and professional officers. An application of the principles developed will be made to several fundamental problems.

S 19. SPECIAL PROBLEMS IN RURAL SCHOOL ADMINISTRATION. Unit A. The Development of the Local School Unit. Credit two hours. Daily except Sat., 11. *Caldwell* 250. Professor BUTTERWORTH.

UNIT A, the unit of the course to be given in 1924, will be followed in subsequent summers by UNIT B, School Finance, UNIT C, Pupil Accounting, and UNIT D, The School Plant, thus furnishing a four-year cycle of intensive work.

Unit A deals with three major problems: (1) The present condition of rural education in the United States; (2) An analysis of causes of this condition; (3) Factors in improving the situation. Among the specific topics to be considered are: educational implications of the rural environment; developing a group sentiment for better rural education; the nature and the form of the local school unit as contributing to that end; special phases of consolidation; analyzing and evaluating activities of local professional officers; the process of rural school leadership; methods of leadership; principles in the effective organization of local school units; purposes and methods of parent-teacher associations. Each member of the class is expected to make special study of an appropriate problem.

S 20. ADMINISTRATION AND SUPERVISION OF VOCATIONAL AGRICULTURE. Credit two or three hours. Daily except Sat., 9. *Caldwell* 294. Professor WORKS.

This course is designed for persons engaged in the supervision of vocational agriculture or those planning to enter such work. It deals with administration and supervision of agricultural education under the Vocational Education Act; State legislation; related Federal legislation; curricula. Visits to schools in New York and adjacent states are required as a part of the course.

S 21. SUPERVISION AND ADMINISTRATION OF HOME ECONOMICS. Credit two hours. Daily except Sat., 2. *Caldwell* 100. Miss ZUILL.

Intended for supervisors and for teachers of experience who are preparing for supervisory positions in home economics. The course is concerned with the analysis of the supervisor's work and with methods of supervision. Among the problems presented for study and investigation will be the organization and the administration of homemaking departments; departmental budgets; reports; equipment and building plans; principles underlying present-day changes in home economics education; principles underlying the organization of courses; evaluation of teaching; improvement of teachers in service; teachers' conferences and study classes.

S 29. RURAL ELEMENTARY CURRICULUM. Credit two hours. Daily except Sat., 9. *Caldwell* 292. Professor BURNHAM.

What is the function of elementary education? How is the curriculum related to the accomplishment of this major purpose? What factors should be considered in making a curriculum for the rural elementary school? How should it be related to rural life, to agriculture? How should it be organized to fit the ungraded school? Should it differ at all from the curriculum for city schools? How should the contents of the curriculum be organized to promote most effective learning? In what respect is the teacher responsible? How do the answers affect the several school subjects?

Intended not only for those who are to work specifically in this field, but also for any whose work is related to it, such as nature study specialists, junior project leaders, and principals of elementary schools.

S 30. PREPARATION OF TEACHERS FOR RURAL ELEMENTARY SCHOOLS. Credit one or two hours. Daily except Sat., 3. *Caldwell* 292. Registration by permission. Professor BUTTERWORTH.

To meet the needs of those now responsible for the training of rural teachers or who are preparing for such duties. A general analysis of the teacher's work will first be made in order to determine the needs that teacher-training courses should supply. Ways and means of meeting these needs will then be considered in as much detail as time allows. A few of the problems for consideration are: training in school and in service; amount and character of differentiation for different types of teaching positions; the organization of materials into courses and curricula; types of teacher-training institutions and activities such as training classes, county normal schools, state normal schools, correspondence-study courses, and teachers' institutes; facilities for observation and practice teaching; the organization of a department of rural education in a state normal school; the function of the state in the training of teachers.

S 31. TECHNIQUE OF TEACHING IN RURAL ELEMENTARY SCHOOLS. Credit two hours. Daily except Sat., 10. *Caldwell* 282. Miss HALE.

The purpose of this course is to consider with as much detail as time permits the many specific problems of the classroom teacher. Some attention will be given to preparation for the first day of school, making a daily program, suiting the course of study to an ungraded school, providing educative seat work for children. Special attention will be given to methods of teaching in primary reading, phonics, beginning arithmetic, language work, problem teaching in geography and history, teaching appreciation in literature, developing hygienic and civic habits through school activities or other features.

S 33. TECHNIQUE OF RURAL SCHOOL SUPERVISION. Credit two hours. Daily except Sat., 8. *Caldwell* 250. Professor BURNHAM.

This course is devoted to a practical consideration of the district superintendents' problems in supervising rural schools. The topics considered will be adjusted to the interests and problems of the group; the function of the supervisor in promoting efficient teaching; standards for judging the many phases of school work, such as the selection of subject matter, the use of textbooks, the assignment, the conduct of the recitation. Available means of supervisory leadership are suggested for consideration. The experiences of the class, procedure and practice in other states, and the suggestions from principles of education will be utilized to develop practical plans of supervision.

S 35. THE JUNIOR HIGH SCHOOL AND THE RURAL COMMUNITY. Credit two hours. Daily except Sat., 9. *Stone* 192. Mr. SPENCER.

A survey of the development of the junior high school with particular reference to its function in rural communities. Discussion falls under such headings as: Causes contributory to the development of the junior high school; its place in the reorganization of public education; its aims and essential features; types of administrative organization; types of curricular organization; demands for adaptation in teaching-methods; the teaching force; buildings and equipment; provision for activities outside the classroom; and other school problems incident to the establishment and operation of a junior high school in the small town or open country.

S 41. EDUCATIONAL AND VOCATIONAL GUIDANCE. Credit one hour. M W F, 2. *Caldwell* 143. Professors FERRISS and EATON.

A study of the larger aims of guidance; of trend and status in the guidance movement; of sociological objectives and the discovery of aptitudes with reference to them; of the place and function of agencies in guidance; of school and other resources for guidance; of school organization and curricular adjustments appropriate to the ends of guidance; and of methods and procedure in teaching designed to make choice of life modes and pursuits.

S 45. THE THEORY OF VOCATIONAL EDUCATION. Credit two hours. Daily except Sat., 10. *Caldwell* 492. Professor EATON.

Open to graduate students in Rural Education or in Education, and to other students upon approval by the instructor.

This course consists in discussions of questions developing the social, economic, and psychological implications of a publicly maintained system of vocational education.

S 47. HISTORY OF THE PHILOSOPHY OF EDUCATION. Credit two hours. Daily except Sat., 10. *Caldwell* 143. Professor MOORE.

The purpose of this course is to trace the development of educational thought and practice as revealed in the social, economic, political, and religious conditions in various nations and periods. The relationships to present problems and procedures will determine the emphasis given the various topics considered.

S 63. SCIENCE IN THE RURAL SECONDARY SCHOOL. Credit two hours. Daily except Sat. 9. *Fernow* 16. Mr. BEAMAN.

A study of the science program in rural high schools; the functions of the recognized high school sciences such as general science, biology, zoology, physics, chemistry, and physical geography, together with methods of teaching. Designed primarily for experienced teachers. Teachers will find it useful in connection with this course to take in addition at least one hour's work in General Biology S 1, where problems in laboratory practice and technique will be presented.

RURAL ENGINEERING

S 10. HOUSEHOLD MECHANICS. Credit two hours. For women students. Lectures, T Th F, 10. *Rural Engineering Building*. Practice, T Th, 2-4:30. *Farm Mechanics Laboratory*. Extension Professor BEHREND.

A course in household mechanics intended to develop ability to think and to reason in terms of mechanical devices. Among the problems selected for this training are exercises in plumbing, soldering, and power transmission, and studies in the principles of operation, care, and repair of small mechanical devices, sewing machines, domestic electrical equipment, and automobile engines. In addition, practice with hammer, saw, screw driver, plane, chisel, and other common tools will be included to aid those who may have to adjust locks, place and fasten hinges and window shades, fit doors, and do other common household jobs calling for repair or adjustment. Laboratory Fee, \$2.

S 11. FARM MECHANICS. Credit one or two hours. Lectures, T Th F, 8. *Rural Engineering Building*. Laboratory, W F, 2-4:30. *Farm Mechanics Laboratory*. Extension Professor BEHREND.

A course in pumps, rams, water systems, sewage disposal, and plumbing for rural homes. Shallow and deep well pumps of different types will be studied and old pumps repaired. Various types of water systems, such as the simple gravity, pneumatic, and hydro-pneumatic systems will be considered and a simple system supplying hot and cold water for kitchen and bathroom will be installed. With the actual construction of a single chamber septic tank such correlated work as building the forms, placing the concrete, laying out for the tank, etc., will be covered. The plumbing work will consist of a study of kinds of pipe, pipe friction, pipe fittings and fixtures, and the installation of a water system necessitating such work as pipe cutting, pipe fitting, cutting soil pipe, pouring soil pipe, joints, etc. An all-day field trip is planned that several farms may be visited and suitable water systems planned for each.

The selection of tools, publications, bulletins, and laboratory material for teaching the work to high school classes will be discussed. Laboratory fee, \$2.

S 41. FARM SHOP. Credit two hours. T Th, 2-4:30, and S, 8-1. *Farm Mechanics Laboratory*. Assistant Professor ROEHL.

A course for teachers of agriculture in farm carpentry and such correlated drawing as farmers may find helpful in their construction and repair work; selection and care of farm shop tools; tool grinding, saw filing, fitting handles, window repairing, and painting. Special consideration is given to preparing men to teach this work as a part of the vocational course in agriculture. Laboratory fee, \$3.

S. 42. FARM SHOP. Credit two hours. M W, 2-4:30, and S, 8-1. *Farm Mechanics Laboratory*. Assistant Professor ROEHL.

A course for teachers of agriculture in farm shop work including the following: harness repairing, rope work, farm blacksmithing. The farm blacksmithing work is confined mainly to such forge work as will aid in the repairing of farm machinery and in the shaping and tempering of cold chisels, punches, picks, harrow teeth, etc. Special attention is given to the selection of jobs, to the best methods of doing these jobs, and to degrees of skill which should be attained in the performance of them. Students will be expected to demonstrate the performance of one such job. Laboratory fee, \$3.

RURAL SOCIAL ORGANIZATION

S 1. SOCIAL PROBLEMS OF RURAL COMMUNITIES. Credit two hours. Daily, 8. *Roberts*, East Basement. Acting Professor MELVIN.

The aim of this course is to give an acquaintance with the social problems of rural life. These problems are considered primarily as those of community institutions. The movements of population and the economic status of agriculture are discussed to establish a point of view for the consideration of such topics as the home, school, church, health, recreation, government, and maladjustments in rural life. All these problems are analyzed as belonging to communities, and their adjustment is approached from the standpoint of community activity. There is an attempt to connect the course with vital issues in rural life sufficiently that the student may be better prepared for service in rural communities.

S 8. SOCIAL PSYCHOLOGY OF RURAL LIFE. Credit two hours. For advanced students. Prerequisite permission to register. Daily except Sat., 10. *Roberts*, East Basement. Acting Professor MELVIN.

This course deals with rural behavior as a response to particular environment. Certain common assumptions, such as the individualism of the farmer, are examined to determine their accuracy and truth. The aim is to give an understanding of the habits, customs, folkways, and social attitudes of rural folk. The inductive method of study is used as much as possible.

S 16. RECREATIONAL LEADERSHIP. Credit two hours. Daily except Sat., 9. *Roberts Assembly*. Professor FELTON.

The aim of this course is to prepare students for recreational leadership in schools, granges, churches, and other community meetings. The following subjects will be considered: The educational value of play; the periods of childhood and their relation to a course of play and games; play as physical training; play for the development of social relations; play for the formation of habits and character; the place of play in the home; the home playroom and playyard; school playgrounds; community playgrounds; recreation in the program of the church; recreational programs for community halls; play days in rural schools; historical pageants and festivals; story telling; and amateur dramatics.

S 18. RURAL COMMUNITY ORGANIZATION. Credit two hours. Prerequisite Course 1. Daily except Sat., 8. *Fernow 118*. Professor FELTON.

The aim of this course is to help rural teachers, school supervisors, county agents, and other rural leaders in the technique of organizing rural communities for unified, effective community service. Typical communities will be analyzed and discussed to arrive at the problems involved and their solution. The methods of local organization in successful communities will be studied. The programs of the grange, church, school, farm bureau, home bureau, cooperatives, lodges, and other social and economic institutions will be discussed and related to a unified community program.

S 19. PAGEANTRY. Credit two hours. Daily 10. Daily conferences and practice periods to be arranged. July 7 to 26. *Roberts Assembly*. Dr. HUDSON.

A three weeks' course, one hour of class work and a two-hour conference or practice period each day. In the class work, the purposes and technique of pageantry will be discussed. Lectures will cover writing the pageant-book, pageant grounds and stages, costumes, music and dancing, rehearsals, and all general problems of production. In the conference and practice periods, stress will be laid

upon the collection of materials for pageants and upon writing pageant-books; students will be allowed to work out, under guidance, original episodes or complete pageants, based upon the history of their own communities; also to discuss individual problems and to experiment with special problems of production, such as grouping, pantomime, marching, and speaking. In connection with this course, a pageant typical of New York rural life will be produced.

S 20. RURAL DRAMATICS. Credit two hours. Daily, 10. Daily conferences and practice periods to be arranged. July 28 to August 15. *Roberts Assembly*. Dr. HUDSON.

A three weeks' course, one hour of class work and two hours of practice work daily. This course will deal with the production of plays, particularly one-act plays, by amateur groups. This course will be adapted to the needs of granges, schools, churches, Sunday schools, home and farm bureaus, community clubs, and civic clubs. One purpose is to help communities produce plays at the county fairs in connection with The Little Country Theater. Choice of plays, coaching, rehearsal, delivery of lines, and acting will be dealt with in lecture and in practice periods. All the details of putting on a play will be discussed: financing, advertising, staging, and costuming. Production of one or more short plays by the class will be made a special project.

VEGETABLE GARDENING

S 1. VEGETABLE GARDENING. Credit one hour. Lectures, M W F, 8. *Poultry 325*. Laboratory, F, 9-12 or 2-5. *Vegetable Greenhouses and Gardens*. Assistant Professor SCHNECK.

This is an introductory course in home vegetable gardening and school gardening, of value to those interested in the teaching of vegetable gardening in secondary schools. The course consists of studies of the principles and practices of gardening as applied to the production, harvesting, and storing of vegetables.

Planning and management of the garden, seed and seed-handling, growing early plants, special requirements of the various vegetable crops, and insects and diseases will receive consideration. Laboratory exercises are planned to show application of principles discussed in the lectures. This course should be of aid to teachers of nature study and also to teachers in agricultural high schools.

S 2. ADVANCED VEGETABLE GARDENING. Credit one hour. Lectures, T Th, 11. Laboratory, one field trip a week, time to be announced. *Poultry 325* and *Vegetable Gardens*. Assistant Professor SCHNECK.

This course is intended for students who have had experience in vegetable production or handling and who desire to secure more knowledge of the scientific principles underlying the production and handling of vegetables.

The aim in this course is to show the application of fundamental sciences such as chemistry and botany to the production and handling of vegetables. It should be of special value to high school science teachers as a means of helping them to introduce scientific ideas to high school students in connection with vegetable gardening. It is also of value to students in home economics as a means of indicating the importance of vegetable food in the diet and the best methods of selecting and handling different kinds of vegetables for quality.

The field trips will be taken to the College gardens where experiments with vegetables will be studied and also to the best vegetable farms in the vicinity of Ithaca.

S 3. SYSTEMATIC VEGETABLE GARDENING. Credit one hour. Lectures and laboratories, M W, 2-5. *Vegetable Gardens*, East Ithaca. Assistant Professor SCHNECK.

This course should be of value to teachers of agricultural botany as well as to those interested in agricultural high school teaching.

Lectures on the origin, history, and taxonomy of vegetables; lectures and laboratory studies of different vegetable types and varieties; their characteristics and adaptability to different conditions. Important varieties of all the different vegetables are grown in the gardens, giving an abundance of material for study as well as for preparing and judging exhibits.

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